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The Study of the Two Lungs Separately in Practical and Research Work*

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When collapse therapy was generally accepted in the treatment of tuberculosis, particularly surgical collapse therapy, it was necessary to have some knowledge of the functional pulmonary capacity in order to judge to what extent the field of hematosis could be safely reduced.

The studies of Brauer, Knipping and others brought out data and tests for determining respiratory reserves, which give sufficiently exact information concerning the functional state of the two lungs together. The tests do not, however, indicate what part a diseased lung, for instance, contributes to the total respiratory reserves, a problem which presents itself daily in connection with collapse therapy.

Jacobaeus and his associates, Frenckner and Bjorkman,[1] introduced in 1932 a new bronchoscope model which permitted the spirographic study of each lung separately. Later, in 1934, Frenckner[2] perfected their bronchoscope and Bjorkman[3] published the report of their first seventy spirometric studies of the two separate lungs.

The results obtained were of unquestionable importance, not only in showing the functional state of each lung, but also in leading to the investigation and solution by Jacobaeus and Bruce[4] of various problems of the physiology of respiration.

Finally, Gebauer[5] proposed a rubber tube with two ducts and with two balloons inflatable by means of a third tube, which permitted separation of the air of one lung from that of the other. Zavod[6]

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slightly modified this apparatus, adopting a separate communication for each balloon.

The greater ease of using a flexible tube instead of a rigid bronchoscope, and the importance of separate lung studies of patients who are to be subjected to irreversible collapse therapy, prompt us to use the Gebauer tube and to effectuate the spirometry of each lung separately.

TECHNIQUE

A good technique for introduction of the Gebauer catheter requires attention to certain details in the preparation of the patient, in anesthetization, and in the introduction of the tube. The technique employed at present has been developed in trying to overcome various difficulties encountered in the original technique. One of us submitted to the procedure, thus helping greatly to correct and improve the technique and to interpret certain conditions. In the majority of cases we achieve a test so free from discomfort to the patient that it might be indicated as a routine examination, exceptions naturally being made in those cases where the diseased state of the tracheobronchial mucosa prevents a good anesthesia.

Preparation of the Patient—We prescribe complete abstinence from food for at least six hours prior to the test. Sedatives are almost never used. We have administered 0.001 grain of sulfate of atropine half an hour before the start, for the purpose of reducing the bronchial and oral secretions on very few occasions. Any inconvenience caused by accumulation of saliva is avoided by having the patient's head tipped so that the saliva can drain from the open mouth. The bronchial secretions constitute little inconvenience except when they are abundant, as in bronchiectasis, and then atropine is ineffective. Nevertheless, this indication ought not be completely disregarded.

Anesthesia—This is of chief importance. Without good anesthesia the examination cannot be peacefully carried out, if at all. As it is necessary to anesthetize the glottis, trachea and left main bronchus, and as the anesthetics have a limit of tolerance, it is essential to anesthetize this large area with the least possible quantity of the drug. Two per cent solution of pantocaine is used. We begin by spraying the base of the tongue, soft palate and posterior pharyngeal wall, using a De Vilbiss atomizer. Five minutes later, under laryngoscopic control, we place ½ to 1 cc. of the solution on the vocal cords at the same time that the patient says "ah." The cough which this application produces, disperses the liquid over the neighboring mucosa. Three or four minutes later one finds the glottis almost numb, permitting a second instillation of the anesthetic, drop by drop, finding out in this way those parts which are still sensitive, over which the application is then repeated.

Once the vocal cords are anesthetized we can easily place between them the bent tip of the atomizer and spray ½ cc. of the solution into the trachea, an amount which is usually sufficient for that area. Almost immediately a small catheter (Lapine's lipiodol tube) is introduced to the lower third of the trachea by means of the forceps of Garcia Vicente, always under the control of the laryngeal mirror. The patient is then inclined toward the left side and ½ to 1 cc. of the anesthetic is injected. Cough and a sensation of heat at the seventh chondrosternal joint indicate that the desired point has been reached. The use of a catheter for anesthetization of the main bronchus enables the entire amount of solution injected to reach that particular area, which does not occur when it is dropped through the glottis, since a large part of it then remains on the walls of the trachea. Finally, the base of the tongue and the pharyngeal wall are sprayed again with the atomizer, since they have regained some of their sensitivity by this time. Three minutes later the Gebauer catheter is introduced. In all, some twenty minutes have passed since the anesthetization was begun, and from 3 to 4 cc. of 2 per cent pantocaine have been used.

Introduction of the Catheter—After instructing the patient to pull on his tongue with his left hand, the epiglottis is visualized in the laryngeal mirror and is hooked and pulled forward against the base of the tongue with the curved tip of the catheter. Keeping the catheter in the median line, we see that it passes between the vocal cords. At this point the operator feels the resistance of the anterior wall of the trachea as the tip of the catheter comes in contact with it. The tube is now rotated so as to turn the tip from the anterior to the left lateral wall of the trachea. As its insertion is continued in this position, it invariably enters the left main bronchus unless there are marked deviations of the tracheobronchial tree.

From the moment that the tube passes into the trachea the patient may feel shortness of breath, and in many cases cough and distress; and for that reason he is asked not to breathe from the moment the glottis is passed until the tube is in place in the left bronchus, thus avoiding such discomfort.

The most common difficulties encountered in the introduction of the Gebauer catheter are blocking of the tip behind the arytenoids, and inability to hold it in the median line between the posterior pharyngeal wall and the epiglottis, owing to the position or size of the latter. The first of these difficulties is overcome by withdrawing the tube slightly, and proceeding again with the patient's head in extension. The second difficulty necessitates pulling the epiglottis forward toward the base of the tongue by means of a hook while the catheter is moved into the median line.

Progress of the Test—As soon as the catheter is in the left main bronchus the balloons should be inflated. Their pressure is con-

trolled with a manometer, which remains connected throughout the test. When the balloons are distended slight oscillations of the manometer which register the changes in the bronchial and tracheal diameters corresponding to the respiratory movements, can be observed.

At this time, if there is any important difference in the capacity of the two lungs, the inequality in the air currents in the two branches of the catheter will be noticed. This, in turn, indicates that the separation of the lungs has been established. When this occurs air is neither inhaled nor exhaled through the nose or mouth of the patient, but only through the branches of the catheter.

After the apparatus is assembled and before it is applied clinically it is necessary to ascertain to what pressure the balloons may be inflated. To gain this information we test each catheter with a mercury manometer while they are in the trachea and bronchi obtained from fresh cadavers. Generally, for this arrangement, pressures which oscillate between 20 to 25 cm. are sufficient.

The use of this method is contraindicated in ulcerous lesions or marked hyperplasia of the larynx, trachea and left main bronchus, as well as certain deviations of the latter, especially if they tend to close the angle which it forms with the trachea. In this case, the bronchoscope will disclose the reason for the difficulties.

For the functional examination two Benedict Roth metabolism machines were used. Recently we had an apparatus constructed which permits the simultaneous inscription in a single graph of both lungs, and whose cylinders are of small diameter but much higher, so that with equal volume we obtain twice the height in the register. The dead space which the whole arrangement, including the Gebauer tube, contains is only 80 cc.

RESULTS

Among the seventy cases that were examined by this method there were some normal persons, some with unilateral or bilateral tuberculosis, some with unilateral pneumothorax, others with thoracoplasty, atelectasis and tuberculous fibrothorax. The results obtained in general concurred with those of previous investigations by authors mentioned above. The studied cases are sufficient to demonstrate that examination of each lung separately is of the greatest importance in the evaluation of the limits of functional pulmonary capacity.

The factors which were considered in the spirometry of each lung are as follows: (1) minute respiratory volume; (2) oxygen intake; (3) equivalent respiration (volume of ventilated air from which 100 cc. of O_2 are consumed); (4) vital capacity. These data, grouped together (Figs. 1 and 2), permit an estimation of the contribution of each lung and of the relationship of each to the total of both

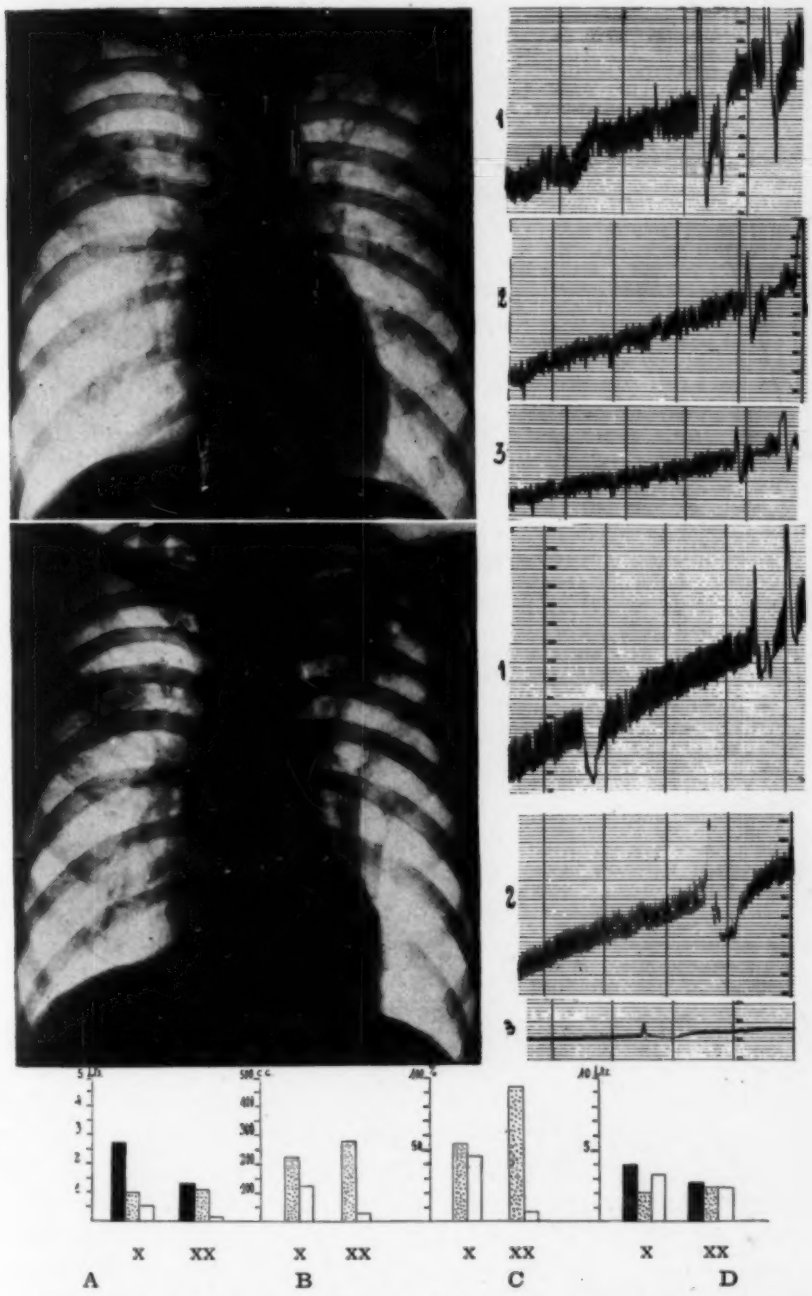

Fig. 1—Domingo, D., 25 year old waiter. Case No. 10715. A: Bilateral fibro-caseous tuberculosis of the lungs, cavity on the left side. Before pneumothorax.—B: (1) Readings from both lungs; (2) Readings from the right lung; (3) Readings from the left lung.—C: Twenty days after starting pneumothorax. Pneumothorax is contraindicated because of multiple adhesions in the apices. Marked reduction in the functioning of the left lung is due to the ill-advised collapse of the lung.—D: (a) Vital capacity; (b) Consumption of 0_2 per minute; (c) Respiratory volume per minute, (per C.); (d) Ventilation equivalent.—x: Before pneumothorax; xx: After pneumothorax.

lungs. In general, the results of bronchospirometry done in the usual way, i.e., the sum of the measurements taken separately on each lung corresponds to the figures for measurements of both lungs together. The small differences between the two (reduction of vital capacity and greater oxygen intake during bronchospirometry) are easily explained by the difficulty of taking deep inspirations, and the greater apprehension of a patient submitting to a procedure which hinders complete muscular relaxation and correspondingly increases the oxygen consumption.

We feel then, that bronchospirometry has great value in the appraisal of the respiratory apparatus of patients undergoing surgical collapse therapy, whose pulmonary function offers doubts concerning the respiratory reserves. The lack of accidents in our observations, and the ease with which intubation was accomplished after the first few trials, strengthen our opinion. The procedure was performed in one of us, keeping the tube within the trachea and left bronchus for more than half an hour. The tolerance was so perfect that, without a rest period, the subject reapplied himself to his professional tasks at once.

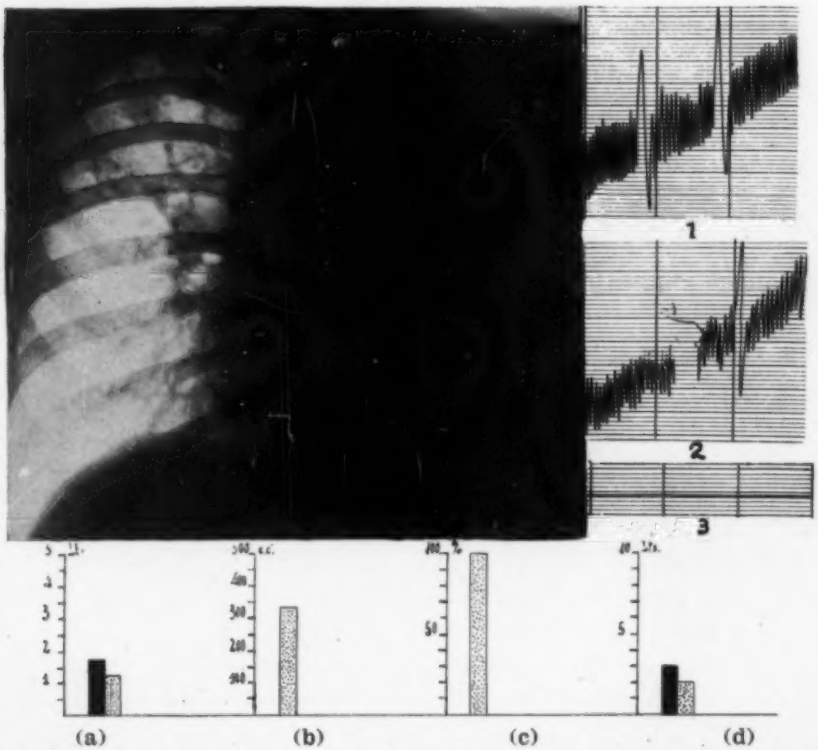

Fig. 2—Alfredo M., 35 year old clerk. Case No. 6138. A: Bilateral pulmonary tuberculosis, cavity on the left side. The left lung with pneumothorax shows a tendency to form adhesions.—(1) Readings from both lungs; (2) Readings from the right lung; (3) Readings from the left lung.—(a) Vital capacity; (b) Consumption of O_2 per minute; (c) Volume of respirations per minute; (d) Equivalent amount of air.

We believe, then, as Leiner and his associates,[7] that although it is not necessary to use this procedure in all cases subject to collapse therapy, recourse ought to be made to it each time a patient is to be subjected to surgical collapse treatment and there are doubts concerning the functional pulmonary capacity.

Apart from this important contribution, the spirometry of the separate lungs offers a promising field for research. For our part, we have taken advantage of this method to study: (1) The concentration of carbon dioxide in the residual air of normal subjects; (2) pulmonary atelectasis following aspiration of residual air; (3) the influence of decubitus lateralis on the pulmonary rest; and (4) the cardio-pneumatic movements—topics to which we now turn our consideration.

CONCENTRATION OF CARBON DIOXIDE IN THE RESIDUAL AIR OF NORMAL SUBJECTS

Recent research has placed in doubt the "plateau" which Haldane and Priestley observed in respect to the concentration of CO_2 in alveolar air (Mackay, Cotton). The first of these investigators found that the CO_2 increased in a majority of cases, if the air was extracted in progressive samples; and Cotton[8] found a paradoxical increase of O_2 in the deepest samples.

The importance which this discrepancy has in respiratory physiology is very great, in view of the fact that the measurement of the partial concentration of the gases in alveolar air is fundamental for the knowledge of hematosis. Having possibilities to develop a procedure for the progressive extraction of samples of residual air, somewhat similar to that used by Lowy and von Schrotter in their studies on alveolar air, we were prompted by the importance of the problem to undertake the study of the composition of residual air, comparing it with the composition of the alveolar air.

Method—Anesthetization of the superior air passages and introduction of the Gebauer tube are carried out in the manner previously described. Air is withdrawn from the right lung in the following manner: The catheter transmitting air from this side is connected with a glass tube, 5 cm. in length, which terminates at its other end in three tubes, each 2 cm. in length. One of the three is connected with the apparatus for obtaining alveolar air, and the other two are connected with two tubes for collecting samples of residual air. These tubes are under Hg vacuum previously effected, and are closed off until after the alveolar air sample is taken. The patient makes a maximum exhalation through the tube for alveolar air, which is submerged in water so that the air bubbles from the open end. When the bubbles decrease, indicating the end of the exhalation, this tube is closed. One of the vacuum tubes for residual air is opened immediately and the other about one second later, and

about 60 cc. of residual air is sucked into the two tubes by the vacuum. The three samples of alveolar and residual air are analyzed in the Haldane apparatus.

Results—The experiments were carried out satisfactorily in eight normal subjects. From the results obtained (Table 1), it is evident

TABLE I

CONCENTRATION OF O_2 AND CO_2 IN VOL. %

	Alveolar Air		*Residual Air*			
			First Sample		*Second Sample*	
Case	CO_2	O_2	CO_2	O_2	CO_2	O_2
1	—	—	5.11	14.75	5.80	13.21
2	—	—	6.11	12.08	6.31	11.75
3	—	—	4.56	13.34	4.81	12.82
4	5.11	14.90	5.10	13.71	5.34	13.60
5	5.44	12.12	5.68	11.69	5.82	11.00
6	—	—	5.08	15.33	5.26	15.18
7	5.46	11.60	5.55	10.72	5.88	10.69
8	—	—	5.70	13.65	5.86	13.03
	Average		5.361	13.160	5.635	12.660

Increase of CO_2 between first and second samples ..... 0.274 %
Diminution of O_2 between first and second samples 0.5000%

that the concentration of CO_2 is the same no matter which fraction of residual air is taken. The small differences which distinguish the first sample from the second represent the CO_2 which is produced in one second, the lapse of time required to manipulate the apparatus between taking the two samples. Theoretically, it can be explained by the calculation that 100 ml. of CO_2 are produced per minute, and that the residual air of a lung amounts to 600 ml., therefore in one second 1.66 ml. are produced, or an increase of approximately 0.27 per cent for the volume indicated. Marenzi and Costoya arrive at similar results in respect to the influence of the length of the exhalation used for obtaining the alveolar air.

Analagous inferences must admit of the comparisons between the concentrations of alveolar air and residual air. The proportions of CO_2 in the first were less than those of residual air, a difference greater than that found between the two samples of residual air. This is attributed to the sensibly greater time lost between the collection of the alveolar air and the first sample of the residual than between the two samples of residual air. On one occasion, however, (case 4) the proportion of CO_2 in the alveolar and first residual air samples was approximately the same, whether due to

simultaneity of withdrawal, we were not able to ascertain *a posteriori*.

In accordance with these considerations we can conclude that in normal individuals the last fraction of air of a forced exhalation corresponds in composition to the alveolar air withdrawn by suction, i.e., residual air. The composition of the latter varies only in relation to the time; therefore one must admit that this air bears a direct relation to the tension of the gases of the blood circulating through the pulmonary arteries, and that the progressive increase of CO_2 is due to its continued dissipation, theoretically until the tension between the alveolar air and the pulmonary blood is in equilibrium. The findings of Mackay do not in themselves agree, possibly due to the technique which he used in successive expirations, a reason which can explain some discordant results. In regard to the "plateau" which Haldane and his collaborators described, it can only be considered a reality in the hypothetical case of a simultaneous extraction of samples. Mackay, Marenzi and Costoya found it in only a single case of all those studied.

Consequently, with the technique we used, which has no objections, since it eliminates the causes of error which arise in the subject of experimentation, and obtains air directly from the bronchi, one can conclude that the air taken by the common methods for obtaining alveolar air is really alveolar air, and the differences between separate samples depend on a factor which should be taken into account, namely, the time that the exhalation lasts.

Finally, the absolute figures which we have found have relative value, since the individuals were not in basal condition. Some had been washed of CO_2 by hyperventilation; or vice versa, some more or less retained the inspired air as a result of the psychic factors following the introduction of the tube.

In regard to the O_2 in the two samples, we should repeat that in the second there was always a lesser quantity than in the first. Cotton, in his work mentioned above, which we have not been able to find in Argentina, mentions a paradoxical increase of O_2 in the last fractions of alveolar air. Being unaware of the techniques employed, we cannot discuss such results. It should only be said that in our experimentation, which we believe to be free from objections in respect to O_2 as we pointed out concerning CO_2, there was a decrease in the second sample which is attributable to the same causes which gave rise to the increase in CO_2.

PULMONARY ATELECTASIS AS A RESULT OF ASPIRATION OF RESIDUAL AIR

Before concluding this discussion we will point out a finding which we consider of interest. When the air is withdrawn according to the technique explained above, but more rapidly, the patients complain

of slight thoracic pain. We obtained x-rays upon the conclusion of the test which show a partial atelectasis of the aspirated lung.

We obtained x-rays in eight normal individuals who underwent rapid or slow aspiration of quantities of residual air which varied around 100 cc. We stopped at this figure as a precaution, since the vacuum required increased in geometric proportion to the amount of residual air extracted, the patients feeling a disagreeable sensation of oppression or anguish when it exceeded the mentioned volume. Prior to the extraction an x-ray is taken in inspiration, and again during and after the aspiration new x-rays are taken. Finally, another is taken immediately after allowing ventilation of the aspirated lung.

In the eight cases studied the x-rays obtained showed similar pictures, with variations only in the intensity of the signs. The results may be summarized by saying that the aspiration of approxi-

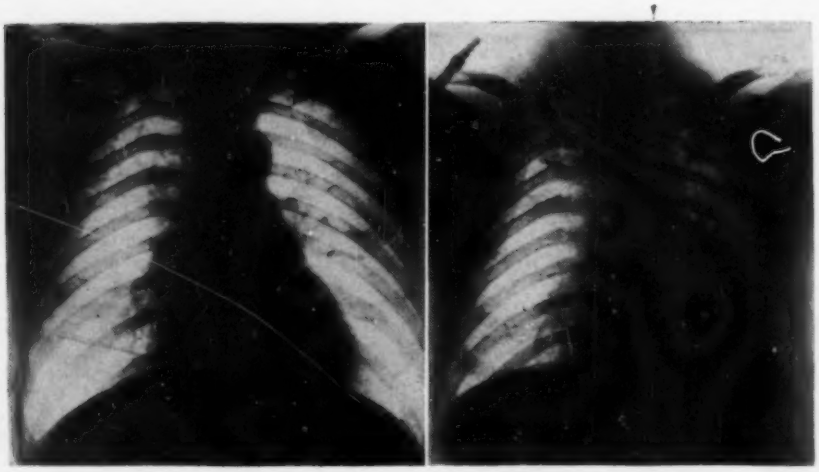

Fig. 3, Case A—Before and after aspiration of 100 cc. of residual air.

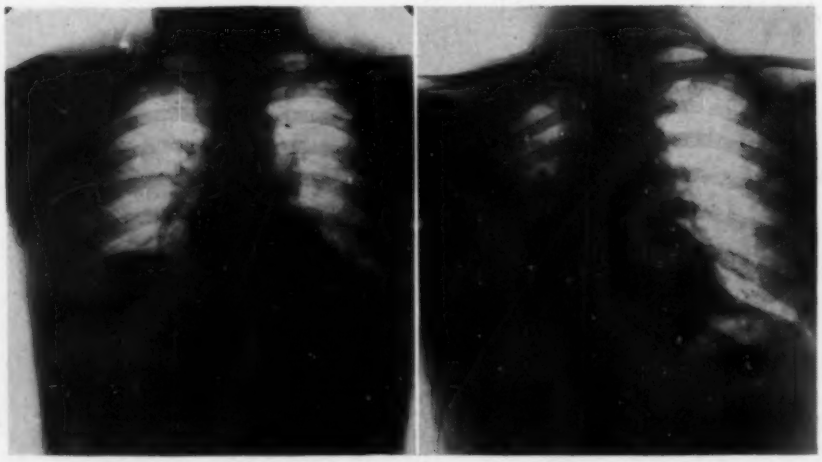

Fig. 3, Case B—Before and after aspiration of 100 cc. of residual air.

mately 100 cc. of residual air produces a picture of atelectasis of the entire lung, of sufficient intensity that one can easily recognize the components of the radiologic syndrome, i.e., deviation of the mediastinum, elevation of the diaphragm, costal retraction and increased density of the pulmonary field (Fig. 3). With respect to the radiologic signs, mention should be made of the intensity of the atelectasis with an aspiration of only 100 cc., as well as the corresponding participation of the mediastinum, diaphragm and costal wall in the reduction of the pulmonary volume.

The atelectatic picture obtained in these conditions is immediately reversible, and the radiographs taken just after ventilation following the test, were normal. None of the subjects experienced discomfort immediately or at any time after the end of the experiment.

THE INFLUENCE OF DECUBITUS LATERALIS ON PULMONARY REST

Functional Study of Each Lung Separately

A study of the respiratory modifications in the various lying positions, particularly decubitus lateralis, has been made by several physiologists and clinicians. We refer to the work of Paillard,[9,10] Webb, Foster and Gilbert,[11] Binet,[12,13] Sauerbruch (1926), Pierson and Newell,[14] and Lowys, Marinet and Marlin, 1936,[15] based on clinical and radiological verifications.

In 1937 one of us (Vaccarezza) in collaboration with G. Pollitzer and J. B. Gomez[16] carried out the study of the same question by means of thoracic measurement and radiograph examination of 12 normal subjects of both sexes. The data compiled permitted the said authors to reach the following conclusions:

1) In decubitus lateralis, the inferior lung had a smaller volume than the same lung when it was above and also than the same lung in dorsalis decubitus; both in inspiration as well as in expiration (Fig. 4).

2) In decubitus lateralis the inferior lung has a greater relative difference in volume between inhalation and exhalation than the same lung in the superior position. This greater difference is

Fig. 4—A: Inspiration; B: Expiration.—(A) Diagram in vertical position; (B) Diagram in right-side position; (C) Diagram in left-side position.

realized, nevertheless, in smaller volumetric amounts than in the other decubiti, that is, in elastic hypotension.

3) Because of this elastic hypotension, the inferior position offers greater rest for a lung than when it occupies the superior position, and also greater rest than in the dorsal decubitus.

The cited works contemplate the amplitude of the respiratory expansion of the ribs and of the diaphragm in each hemithorax, the mediastinal displacement, and the area of radiographic projection of the lung in each of the decubiti.

Technique and Results—The domination acquired in the functional exploration of each lung separately with the Gebauer tube, the innocuousness and relative facility of the method led us to examine 10 subjects in dorsal decubitus and in the two positions of decubitus lateralis in order to establish the existing differences between one position and the other. The subjects examined were males, from 22 to 53 years of age, for the most part healthy or with ailments which did not affect the respiratory function of the lung; in one case only, there existed lesions of pulmonary tuberculosis extending to both superior fields, and in another, symmetrical lesions of emphysema.

In each case we proceeded to determine, in the aforementioned decubiti, the following spirometric factors: (1) oxygen intake per minute, (2) respiratory volume per minute, (3) respiration equivalent or ventilation equivalent (quantity of air inspired for each 100 cc. of oxygen absorbed), (4) vital capacity, (5) complementary air, (6) reserve air.

We obtained in addition "digrafias"[17] (Figs. 5 and 6) in standing position or in dorsal decubitus and in both positions of decubitus lateralis in order to ascertain in each one of them the characteristics of the respiratory movements and the distinct pulmonary surface in anterior-posterior projection, in deep inhalation and exhalation.

The collected data permitted the evaluation of the contribution of each lung to the respiratory process and the volumetric modifications which the organ presents with the changes in posture, both in inspiration and in expiration. In the evaluation of the results of the functional examination, a difference should be pointed out in the comparison of one lung with the other in one decubitus, or in the comparison of the same lung in different decubitus positions. In the latter case the evaluation is less decisive due to the fact that the determinations are not simultaneous and necessarily correspond to different moments.

Spirometric Findings—The spirometric study of each lung separately reveals (Table 2):

1) With respect to the combined function of both lungs: There is no appreciable difference between one decubitus and another in-

sofar as the oxygen intake, respiratory volume per minute, equivalent respiration, vital capacity and complementary air are concerned.

2) With respect to the isolated function of a lung: The intake of oxygen, respiratory volume per minute, the vital capacity and complementary air are higher in the right lung in homolateral decubitus than in contralateral decubitus, the values are approximately the same in dorsal decubitus and in right lateral decubitus; the reserve air reaches its maximum figure in left lateral decubitus and its

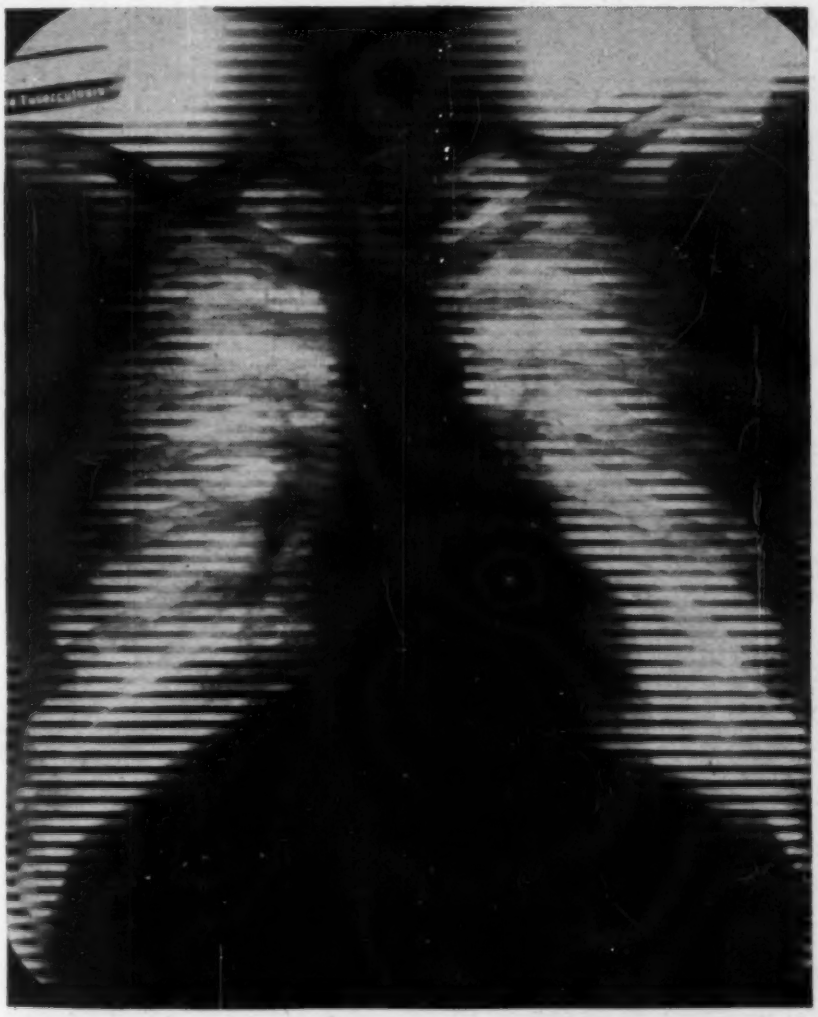

Fig. 5—Diagram taken in a standing position. With a grill in place, this film was exposed during expiration. Thus, a series of regular and equidistant strips were obtained. Immediately afterwards, the grill was moved to cover the exposed strips and expiration was recorded on the remainder of the film. In this way, a film showing a series of regular alternating strips was obtained; one set during expiration and the other during inspiration. When this film is placed in a negatoscope behind a grill which may be moved up and down, it is possible to obtain an idea of the motion of the different parts of the chest.

minimum in right lateral decubitus; equivalent respiration does not show an appreciable variation. Oxygen intake, respiratory volume per minute, vital capacity and complementary air is greater in the left lung in homolateral decubitus than in dorsal decubitus and in

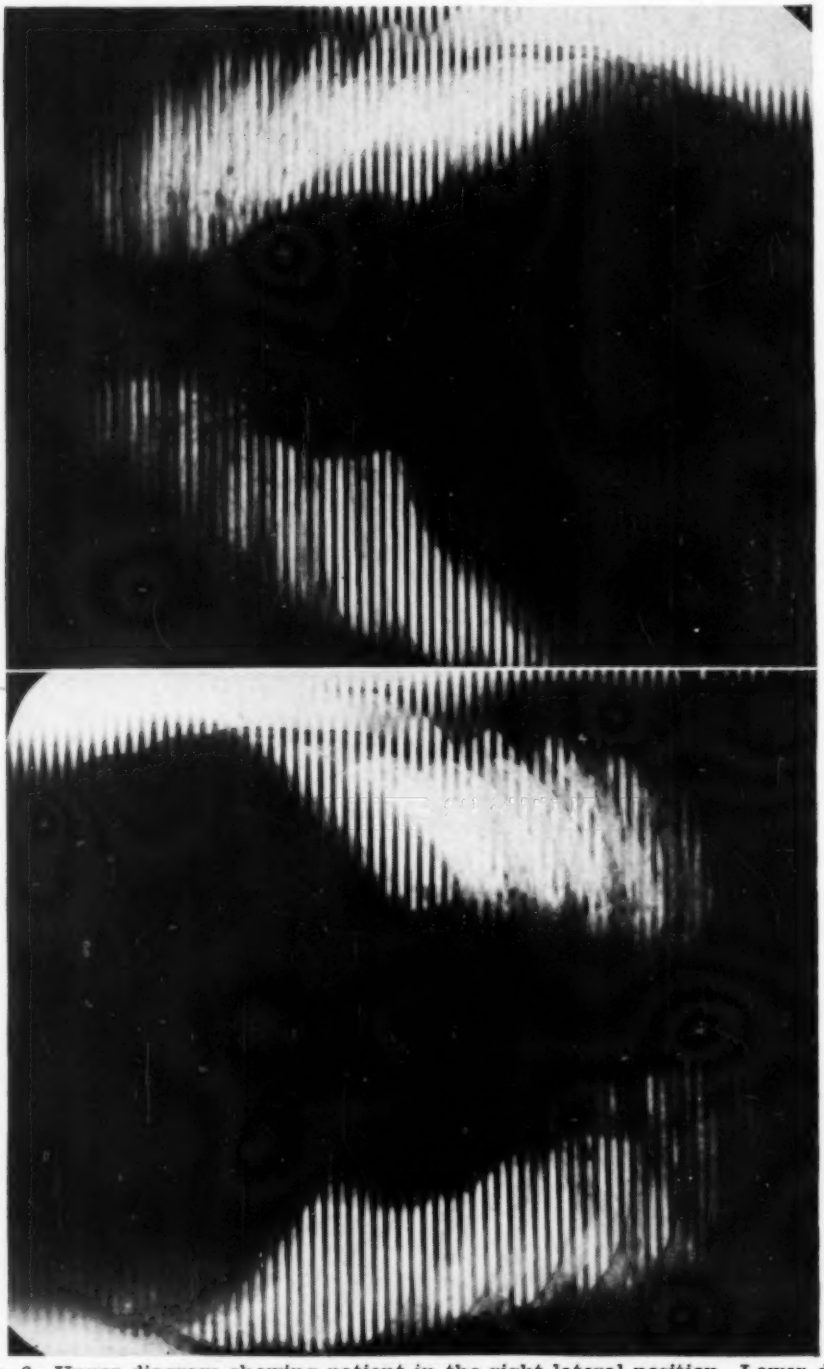

Fig. 6—Upper diagram showing patient in the right lateral position. Lower diagram of the same patient in a left lateral position.

right lateral decubitus; reserve air is greater in right lateral decubitus than in left lateral decubitus, equivalent respiration is optimum in homolateral decubitus.

3) With respect to the functional comparison of both lungs: The right lung ranks over the left in the three decubital positions in respect to oxygen intake (55.5% and 44.4% respectively) in respiratory volume per minute (55.6% and 44.3% respectively), in vital capacity (55.9% and 44%) and reserve air (58.6% and 41.3%). It also predominates in respect to the complementary air and equivalent respiration in dorsal decubitus and right lateral decubitus; however, it is not so in left lateral decubitus.

Radiographic Test—The examination of the digrafias taken agrees in general with the observation of Vaccarezza, Pollitzer and Gomez.[16,17,18] The clear reduction in form of the corresponding lung (inferior lung) physiologically collapsed, by the fall of the mediastinum, the upward rise of the hemidiaphragm and the costal compression of this hemithorax were confirmed in each of the decubitus lateralis positions. The lesser volume is clear even in inspiration, notwithstanding the respiratory mobility of the mediastinum and the widest excursion of the homolateral diaphragm. The compensatory antagonism between costal and diaphragmatic respiration exists inversely in each hemithorax: in the hemithorax of the same side as the decubitus there is an increase in the mobility of the diaphragm and a decrease in costal respiration; the contrary takes place in the opposite hemithorax.

Two subjects deserve a special comment due to the degree of the volumetric modifications observed in them. The first (registration No. 852) with a digrafia without anything particular in the standing position, was characterized by a marked expiratory elevation and a wide respiratory excursion of the corresponding hemidiaphragm in the decubitus lateralis positions, especially in the left lateral decubitus as can be seen in Fig. 4 which reproduces the tracing of the digrafic silhouette. We observed that this case also had a particular behavior from the spirometric point of view because of the functional predomination of the left lung over the right one. It constitutes an exception to many of the general findings previously expounded and must have appreciably reduced the numeral results which have served as a base for them. In this individual, in effect, the intake of oxygen was greater in the left lung than in the right in both lateral decubitus positions; the respiratory volume per minute, the vital capacity, the complementary air and the reserve air were equally greater in the left lung, in the three decubiti examined, and lastly the respiratory volume per minute of the right lung was greater in the left lateral decubitus than in the right lateral decubitus and that of the left lung was greater in the right lateral decubitus.

The second subject (registration No. 11782) also presented a pronounced elevation and wide excursion of the hemidiaphragm corresponding to the lateral decubitus (Fig. 4) but to a less interesting degree than in the previous case and without the predomination of the left side over the right side. The spirometric determinations in this patient did not reveal any important abnormalities. We shall point out that the respiratory volume per minute of the left lung greatly increased from the dorsal decubitus (4767 cc.) to the right lateral decubitus (6300 cc.) an increase which was still further increased in left lateral decubitus (7048 cc.).

These two cases confirm the observed agreement between the results of both the digraphic and functional examinations. In another case (registration No. 11720) whose spirometric values do not satisfy various of the general findings, the digraphic examination was not carried out in the decubitus lateralis positions. The evident abnormalities in this subject (left lung with greater oxygen intake than the right one in dorsal decubitus, and with greater vital capacity, complementary air and reserve air than the opposite lung in right lateral decubitus, can be explained by radiologic findings of emphysematosal alterations in both pulmonary apices. In the subject with bilateral tuberculous lesions (registration No. 11562), the results of the functional examination correspond to almost all of the mentioned general deductions; the following can be stated to be characteristic properties: high figures for equivalent ventilation and low figures for vital capacity and complementary air, in both lungs and in the three decubital positions.

Comments and Conclusions—The results obtained led us to maintain that the pulmonary ventilation in the decubitus lateralis positions is increased in the lung situated underneath and is decreased in the lung lying above. The influence of the left decubitus is more marked than that of the right. The reserve air is increased in the lung situated above.

The functional conclusion which we have established coincides with the physical conclusion reached in the work of Vaccarezza, Pollitzer and Gomez,[16] who recognized that the difference between the volume in inhalation and the volume in exhalation of a lung in the underneath position is greater than that of the same lung in the superior position.

The greater ventilation of the lung which is situated underneath apparently implies a greater work for the same. However, since the investigation of Ascoli and Lucacer it is accepted that the elastic hypotension is the principal factor in pulmonary rest from the therapeutic point of view. In speaking of pulmonary rest, it is necessary to distinguish between functional rest and physical or elastic rest, since one does not always imply the other. The opposite can be presented. There can be presented variations of contrary

sense. It is what happens in decubitus lateralis. The lung situated underneath is ventilated more, but as it does so within volumes of inhalation and exhalation which are less than those when it occupies the reverse position and even in dorsal decubitus, the elastic rest is greater. It is because in the rest of an elastic body the degree of distension possesses greater importance than the changes in volume. And in the case before us the lesser distension of the lung underneath is demonstrated not only by the thoracic measurement and digraphic examination but also by the reduction of its reserve air and surely of its residual air.

Consequently decubitus lateralis represents for the homolateral lung a position of greater rest notwithstanding the increase in the respiratory ventilation of the same.

THE INSCRIPTION OF CARDIOPNEUMATIC MOVEMENTS OF SEPARATE LUNGS

With the patient in apnea each duct of the catheter is connected by means of a rigid rubber tube with one Frank-Wiggers capsule.

The transmission of the heart beat is by a small mirror placed on the above-mentioned capsules, which reflects the light from an electric arc to a kimograph.

At the same time and on the same chart the venous pulse is registered by means of another Frank-Wiggers capsule.

The inscription of cardiopneumatic movements (Fig. 7) of separate lungs shows a record closely related to those of auricular activity with a few accidents of ventricular origin in both sides.

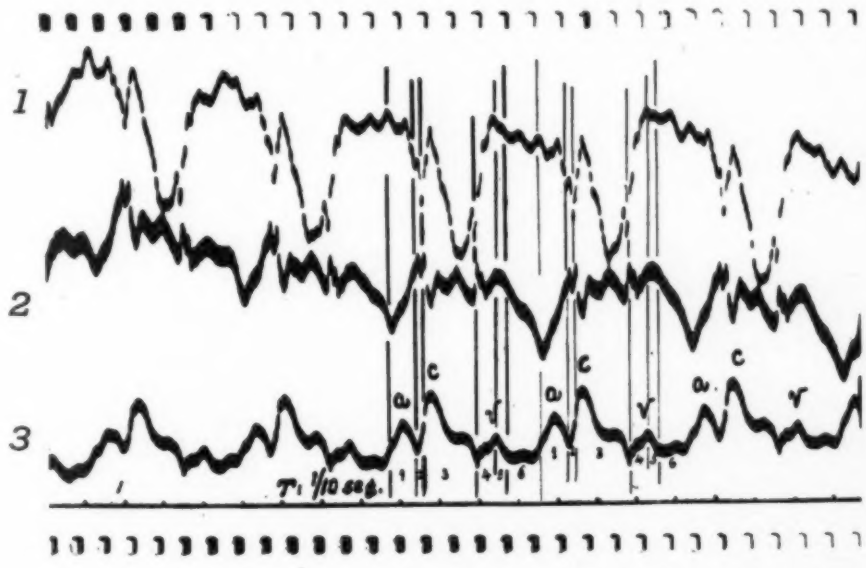

Fig. 7A—Cardiopneumatic movements of separate lungs. (1) Left lung; (2) Right lung; (3) Venous pulse.

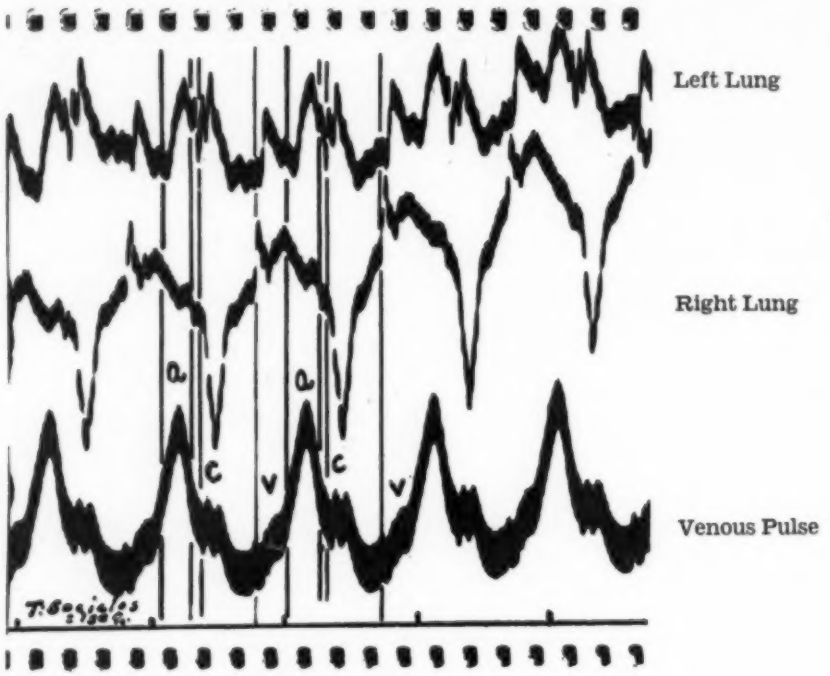

Fig. 7B—Cardiopneumatic movements of separate lungs.

COMENTARIOS Y CONCLUSIONES

La conclusion funcional demostrada por nosotros coincide con la conclusión física obtenida en el trabajo de Vaccarezza, Pollitzer y Gómez,[16] quienes probaron que la diferencia entre el volumen de aire en el acto de inspiración y el volumen de aire en el acto de espiración en el pulmón situado en la posición inferior es mayor que cuando el mismo pulmón ocupa la posición superior.

El grado mayor de ventilación en el pulmón situado debajo indica, aparentemente, que este pulmón trabaja más. Sin embargo, desde la publicación de los resultados de las investigaciones de Ascoli y Lucacer se ha admitido que la hipotensión elástica es el factor principal en el reposo pulmonar, desde el punto de vista terapéutico. Cuando se habla del reposo pulmonar, precisa distinguir entre descanso funcional y descanso físico o elástico, ya que el uno no es siempre igual al otro. Por el contrario, la opuesta situación puede ocurrir. Pueden presentarse casos he sentido contrario. Esto es precisamente lo que sucede en el decúbito lateral. La ventilación del pulmón situado debajo es mayor, pero como quiera que los volúmenes de aire en los actos de inspiración y espiración son menores que cuando este pulmón ocupa la posición opuesta—o aún en el decúbito dorsal—el descanso elástico es mayor. Esto se debe a que en el reposo de un cuerpo elástico el grado de dilatación es más importante que los cambios de volumen. Y en el caso en cues-

tión, la menor dilatación del pulmón de abajo ha sido demostrada no solamente por medio de la medida del tórax y del examen diagráfico sino también por la reducción del aire de reserva e, indudablemente, del aire residual.

Por consiguiente, el decúbito lateral es una posición en la que el pulmón homolateral alcanza un mayor descanso a pesar del aumento en su ventilación respiratoria.

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TABLE II

Both Lungs			*Average of 3 Decubiti*			*Right Lung*			*Left Lung*		
L D	R D	D D	L L	R L		D D	R D	L D	D D	R D	L D
467	421	443	197	246	O_2 Intake per min., cc.	254	250	235	188	171	231
			44.4	55.4	O_2 Intake per min., %	59.3	57.4	50.3	42.5	40.6	49.6
11,780	11,412	12,118	5362	6751	Minute Volume, cc.	6564	6586	6074	5553	4826	5706
			44.3	55.6	" " %	54.1	57.7	51.1	45.8	42.2	48.4
2.57	2.81	2.91			Resp. Equiv., liters	2.60	2.62	2.68	3.22	3.00	2.47
2162	2047	2181	932	1182	Vital Capacity, cc.	1246	1189	1111	934	857	1004
			44	55.9	" " %	57.1	58.0	52.5	42.8	41.9	47.4
1135	1169	1254			Complementary air, cc.	703	699	551	550	469	584
					" " %	56.0	59.7	48.5	43.9	40.1	51.4
509	321	394	162	230	Reserve air, cc	237	172	316	157	149	192
			41.3	58.6	" " %	60.1	53.5	62.1	39.8	46.4	37.8

L D—Left lateral decubitus

R D—Right lateral decubitus

D D—Dorsal decubitus

Actually, we feel that reserve air in the left lung is greater in the right lateral than in the left lateral decubitus. This was so in four cases out of six. However, on averaging the results from all six cases we find that the remaining two cases have unduly influenced the figures. Thus, on our average it would seem that reserve air in the left lung was greater in the left lateral decubitus. The average, therefore, gives a false impression.

The Role of the Roentgenologist in the Diagnosis of Diseases of the Chest*

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The role of the roentgenologist in medicine, generally speaking, is not an easy one. In fact, it is a difficult one, and is becoming more so. Great strides have been made in the advancement of the diagnosis and treatment of disease by means of roentgen rays. There is no special field of medicine where the roentgen examination cannot be useful and helpful. It may corroborate, it may be an aid, or it may be the critical factor in arriving at a diagnosis. The field is large. Specialization within this special field is occurring. The operation of apparatus has been simplified. Many diagnostic positions have been standardized. Routine procedures have been simplified. With it all there is developing a so-called decentralization or perhaps, disintegration, in the field of radiology. This, I believe, will result ultimately in the displacement and perhaps replacement of the roentgenologist. The reasons for this are many. However, I shall not attempt to discuss the causes now. The not too distant future may find the roentgenologist an individual of the past. Time alone will tell. This will depend entirely upon the medical profession. Exceptional circumstances may result in the survival of a few.

Since we have not arrived at that stage, and the roentgenologist still has a role to perform, I shall endeavor to describe his usefulness in the diagnosis of diseases of the chest. Perhaps it would be wiser for me to state that I shall endeavor to describe the many ways in which the roentgen rays, when used judiciously, are helpful in the diagnosis of diseases of the chest.

The roentgenologist employs electro-magnetic waves, observing their effect on (1) a chemically treated screen, and is able to study organs in motion and obtains no permanent record; and (2) on a sensitized film, on which is recorded a permanent record. I cannot refrain from stressing that the use of these electro-magnetic waves is not without danger. The injudicious use of roentgen rays can result and has resulted in considerable harm to both patient and doctor. The pioneers paid dearly. Knowledge of the characteristics of roentgen rays would have avoided disastrous results. They are avoidable, and are avoided today. When these rays are employed

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judiciously, there should be no resulting harm to anyone, either immediate or remote. Harmful effects can be attributed to carelessness only.

I should like to make a plea, if I may, that the word "picture" be dropped from the doctor's vocabulary, when referring to an x-ray film. For in fact it is not a picture. The doctor could not recognize any one of his many patients by looking at a so-called "picture." The x-ray film is not identifiable. And, above all, it is not self-explanatory. Knowledge, skill and experience are required to properly interpret the recorded shadows on an x-ray film.

In the study of chest diseases the role of the roentgenologist depends upon the information the clinician seeks. By clinician I refer to the internist, the pthisiologist, the thoracic surgeon, the bronchoscopist, etc. The clinician seeks information. The roentgenologist's role is to corroborate, assist, or reveal something new. The problem before the clinician must be conveyed to the roentgenologist. In this presentation, I shall think of tuberculosis as though it were under discussion. I shall include other diseases as needs demand, with attention to clinicians collectively.

Serial roentgen examinations are essential in any protracted disease. This does not preclude serial examinations in acute conditions. Repeated examinations permit the study of the development, progression and regression of the pathology. The roentgenologist must be familiar with the roentgen appearance of the disease in question, and therefore with its pathology. The behavior of the lesion on serial study will determine a plan of therapy. It may also help in making a prognosis. During such observations fluoroscopic studies may be made, but permanent records for the purpose of comparison are preferable. The character of the disease process will be revealed. The course may or may not be benign. It is not uncommon for a benign exudative tuberculous lesion to reveal an annular shadow during the resolution phase which completely disappears when resolution is complete. No excavation was present. The benign character of the lesion was revealed. This is not to be confused with a cavity which closes spontaneously. Any therapeutic measures instituted in such a lesion would be credited with a good result. The same good result would have been obtained without any particular therapeutic measures. Knowledge of the disease process is necessary. In this respect, the living pathology, studied serially, over a protracted period of time, differs materially from what the pathologist ultimately demonstrates. The many manifestations in the character of the disease can be followed. If and when spreads and extensions occur, they can be recognized. It must be remembered that not all excavated lesions are tuberculous. Occasionally, pulmonary neoplasms break down. Auerbach has demonstrated non-tuberculous cavities in silicotic lungs.

When a pneumothorax has been instituted, its continuance can be followed by either the fluoroscopic or radiographic methods, or both. The roentgen rays are necessary for the observation of results following exposure in an equalizing pressure chamber.

For the clinician, the routine examination of the chest yields certain useful information. The term routine may vary with different individuals. Many positions for roentgen examinations are available and any or all may be utilized for an examination. The usual routine examination of the chest consists of a fluoroscopic study and a postero-anterior projection in the erect position. To this may be added the antero-posterior, lateral, obliques, various projections in the recumbent and semi-recumbent positions, as well as many eccentric views. These projections may be made during any of the various phases of respiration.

Forrestier introduced iodized oil to visualize the bronchial tree. Its instillation may be accomplished in many ways. Bronchial tubes may be patent, partially or completely blocked, or dilated. Sacculations and cystic diseases in the parenchyma can be demonstrated. Fluoroscopic as well as film studies are advisable. The normal anatomy of the bronchial tree is a constant, and it must be known to evaluate the position of the contrast substance within it. Not much oil is required for this examination. In fact, very little oil is required to outline the bronchial tree of a lobe if the instillation is directed into it by means of a Thompson catheter or bronchoscope. After the completion of the examination, it is desirable to rid the patient of the oil by means of postural drainage. This is advisable in order to prevent retention of the oil in the alveolar spaces, even though retention does no harm. It produces neither a foreign body reaction nor a fibrosis. The oils used in bronchography, if they have not deteriorated, are non-irritating. I may also add that the maladministration of iodized oil into the alimentary canal, or if swallowed, is harmless. Left and McLean have introduced di-iodotyrosine gelatine for the study of the cerebrospinal communicating systems. Dr. Louis R. Davidson has used and recommends use of the same preparation for bronchographic examinations, because of its quick absorption. He claims excellent results.

Iodized oils are not very helpful in demonstrating a tuberculous cavity, either when visualized or suspected. Oily solutions will not enter tuberculous cavities, for the bronchial lumen to the cavity is usually extremely narrow and irregular because of granulation tissue. The heavy oil cannot flow through such an irregular and narrowed airway. These cavities can be demonstrated by the use of watery contrast solutions. This was demonstrated by Dr. Bobrowitz and myself in 1935. Recently Drs. Leon, Green and Serbst have demonstrated shifting fluid levels in cavities of collapsed lungs, in post-thoracoplasty cases, with the aid of sedatives.

Iodized oil is an excellent medium with which to visualize fistulous tracts in the chest wall and lungs. Their courses, locations and extensions can be studied fluoroscopically and radiographically, in various positions, at right angles to each other, stereoscopically, etc.

A putrid lung abscess requires surgical attention. Neuhoff has had excellent results and credits his good results to the exact knowledge of the bronchial tree as described by Glass, and the precise locali-

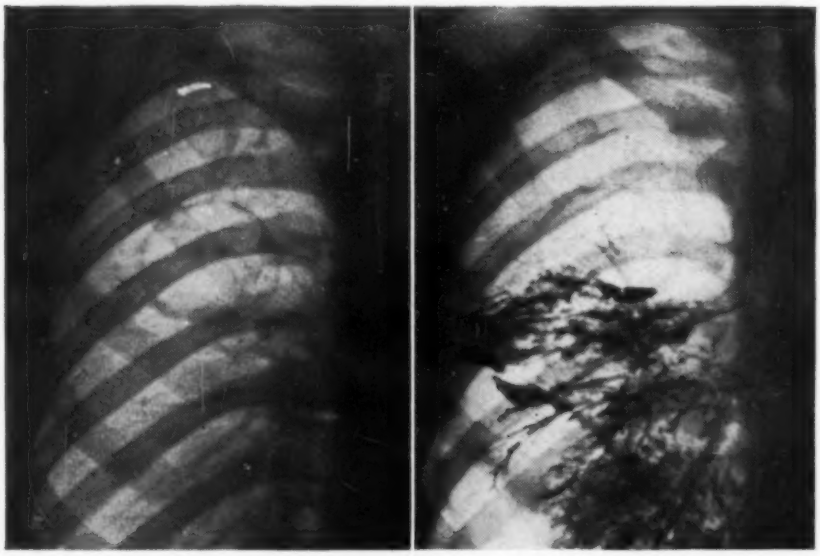


Figure 1A

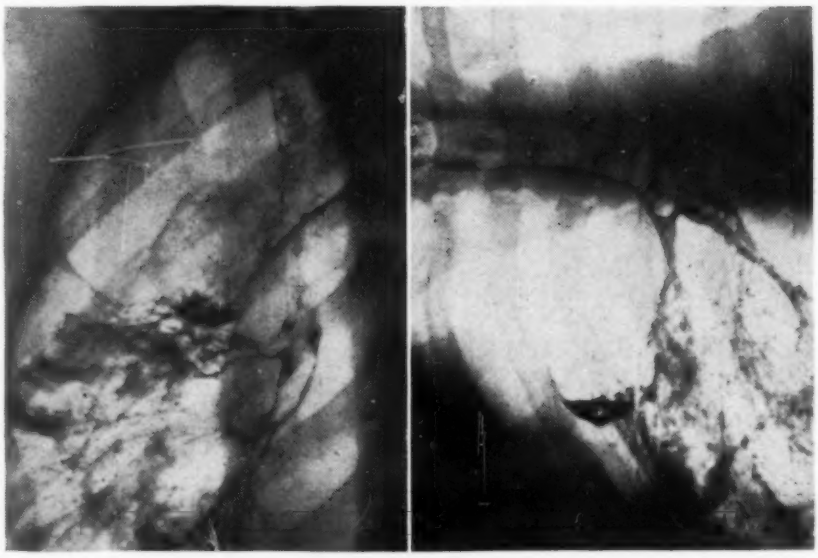


Figure 1B

Figs. 1A and 1B—Non-tuberculous excavation. Iodized oil outlines bronchial tree and demonstrates a shift of oil level.

zation described by Rabin. They claim putrid lung abscesses are superficial. Pleural adhesions develop over the most superficial portion of the abscess—that portion which points, that portion which invites incision. The site of election for surgery is through the area of adhesions, where the pleural space is obliterated. Approximate localization can be obtained by postero-anterior and lateral projections. This is not sufficient for it lacks accuracy. Precise localization is obtained with the aid of the oblique projections. This is augmented by the injection of a mixture of a small quantity of iodized oil and methylene blue into the intercostal muscle at the site of approximate localization. The oil can be demonstrated on the roentgen film, and the methylene blue can be detected at the time of surgery. The site of election for surgery can be precisely determined prior to intervention. The localization will be a given interspace at, above, or below, the oil. At the time of surgery, the methylene blue acts as a marker and guide for the surgeon.

In passing, it is propitious at this time to mention that there are many methods available for localization. The present emergency

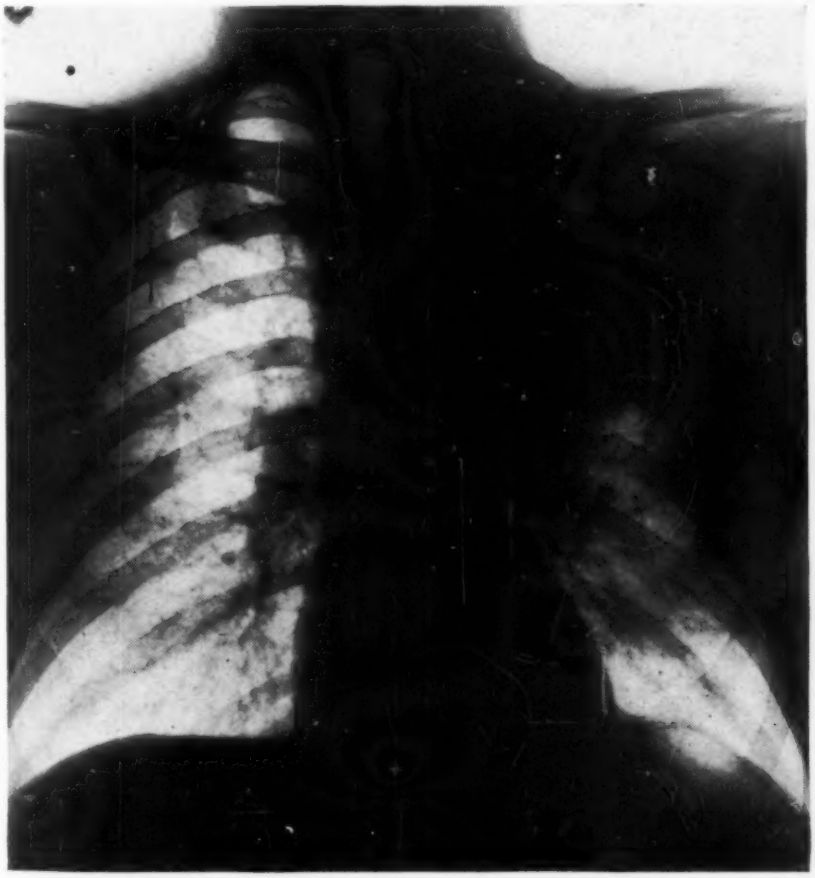


Fig. 2—Excavated lesion in pulmonary neoplasm.

makes it mandatory for all of us to acquire information and knowledge as to the localization of foreign bodies. There are fluoroscopic as well as radiographic methods. Some are simple, others are complicated. Some require the use of apparatuses referred to as compasses. Noll recently described a method of localization, applicable to cavities, obtained by measurements on film transferred to a device which indicates depth. Our armed forces are using an x-ray unit which has an attached fluoroscopic device for rapid localization of foreign bodies. In England, Major Samuels recommends film localization as preferable to fluoroscopic localization. Most methods of localization are based on similar triangles.

Biplane fluoroscopic localization by Dr. Manges aided Dr. Chevalier Jackson in the bronchoscopic removal of foreign bodies from the respiratory tract. An apparatus, the Boloscope, made by Phillips of Holland, employs biplane fluoroscopy for the localization of foreign bodies.

A new apparatus described for localizing metallic foreign bodies consists of two high frequency transmitters, one with a variable

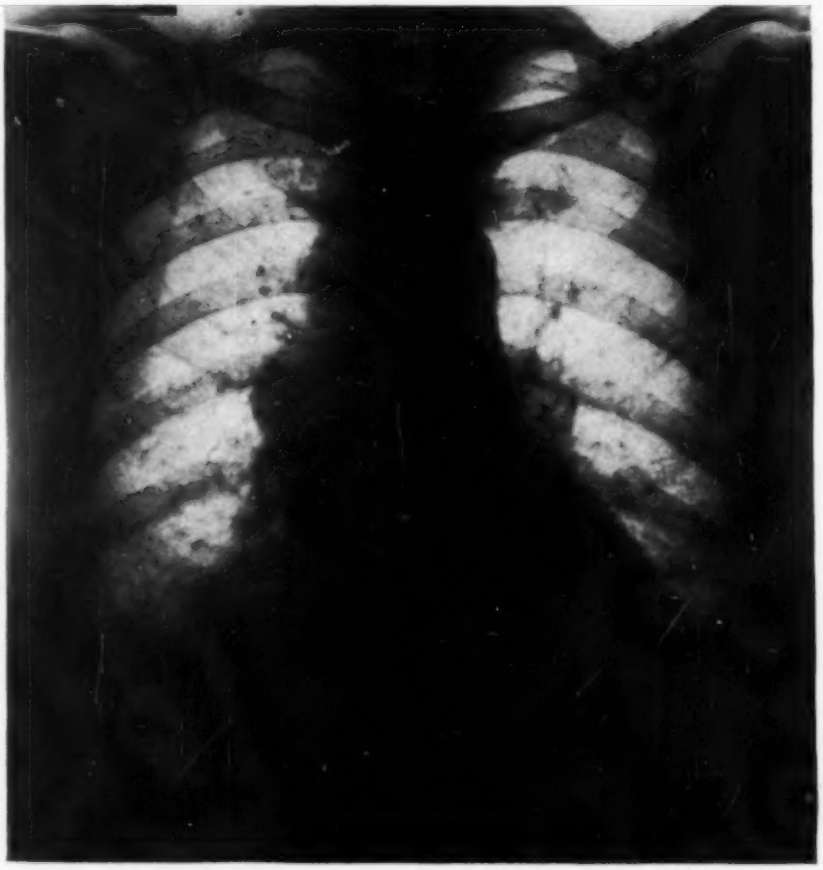


Fig. 3—Hilum adenopathy, right side. Sarcoid.

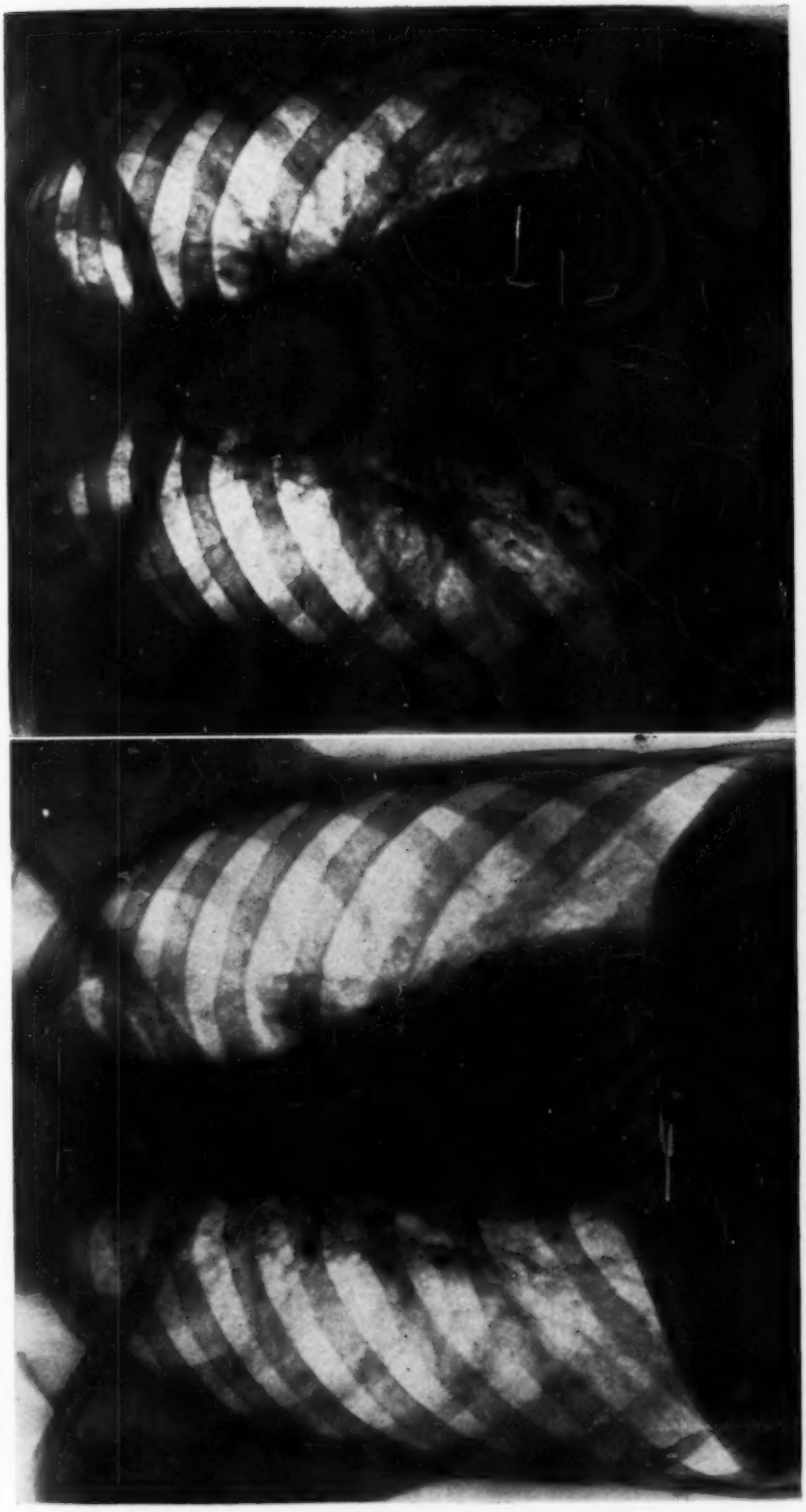


Fig. 4—Sarcoid. Seven-year interval between examinations.

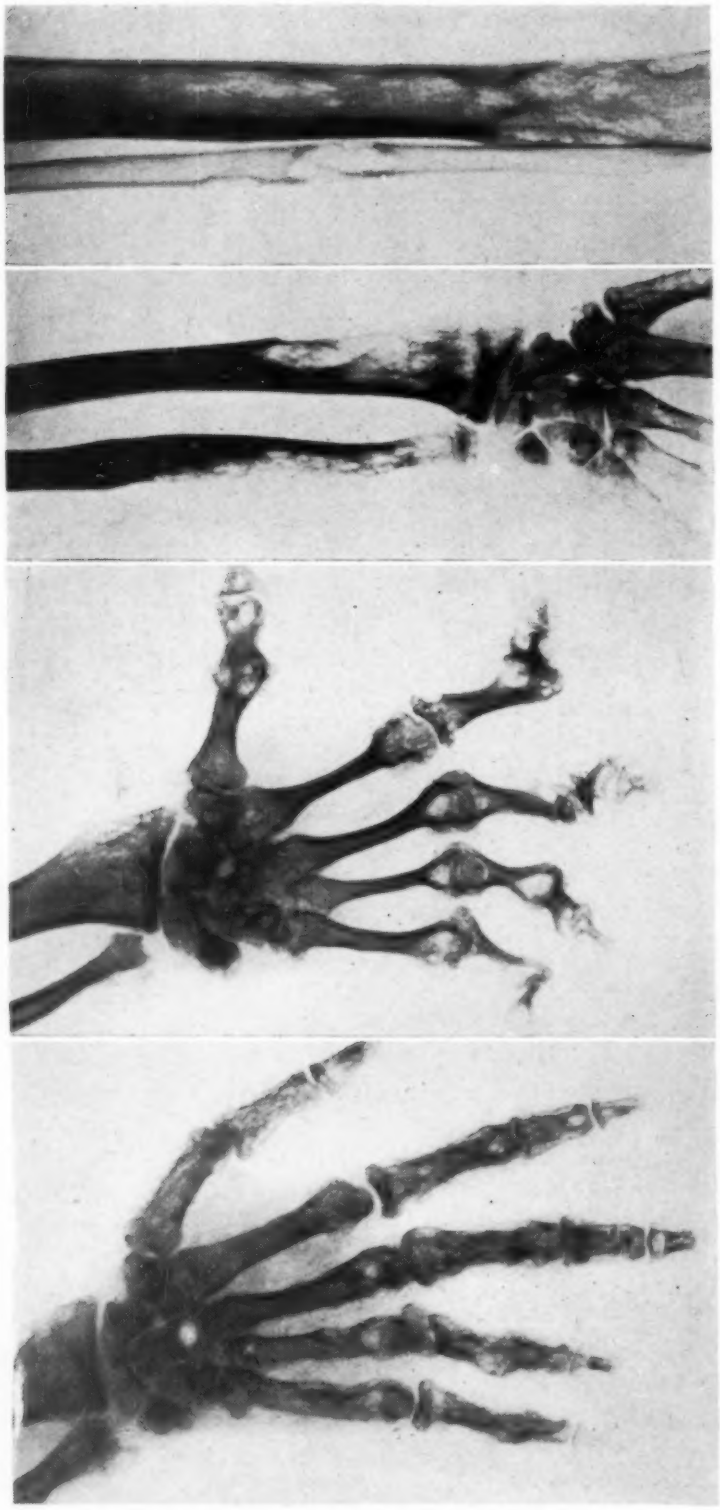


Fig. 5—Osseous changes in sarcoid. Same case as Figure 4. Hand shows the progressive changes after an interval of seven years.

condenser. Localization of a foreign body depends upon sound through a loudspeaker. The presence of a foreign body in the field alters the tone, which may vary from a deep bass to the highest treble, depending upon the foreign body.

A recent news item quoting Dr. Moorhead in Honolulu, mentions a foreign body detector. It works on the principle of a radio tube, with a recording device which indicates the size and shape of metallic foreign bodies.

Mediastinal lesions cannot always be easily differentiated. While it is true that each lesion has some characteristic features, differentiation without error is not always possible. The pathologist has ably proven that fact. I have in mind a cold abscess, a right-sided aorta, a neurogenic tumor, an osteogenic sarcoma arising from a rib, an aneurysm, a dermoid, and even a dilated oesophagus. Others are the diaphragmatic hernias, thoracic stomach, retrosternal thyroids,

Fig. 6—Paracardiac shadow, right side. Eventration. Cardia and portion of pars media over liver.

thymomas, cysts, enlarged paratracheal nodes, atelectatic azygos or other accessory lobes, lymphosarcoma, Hodgkin's, sarcoid, and others. The cardiac lesions are not included.

Recently I diagnosed an aneurysm of the ascending aorta. The diagnosis of an aneurysm was correct. The site of origin was wrong. At necropsy it was found to be an aneurysm of the right coronary artery.* I have no hesitancy in stating that I would not have the temerity to make such a diagnosis, even should I think it.

In order to differentiate the mediastinal lesions kymography, planigraphy, and angio-cardiography may be employed. The study of mediastinal lesions may be aided by oesophagrams.

A cold abscess may be present and its source of infection in one or more of the vertebral segments or disks may not be demonstrable on a roentgen film. Osseous autopsies have demonstrated spinal caries which were not evident on a roentgen film prior to death, or even on a postmortem roentgen examination prior to splitting of the excised vertebral column.

A dilated oesophagus is not difficult to diagnose. I have seen several instances where a dilated oesophagus, filled with food and fluid, resembled a cold abscess.

Kymographic examinations are helpful in differentiating pulsating from non-pulsating lesions. Unfortunately, this is not always true. A kymographic examination does not always depict an aortic pulsation. Mediastinal lesions may show wave formations because of transmitted pulsations. An aneurysm is supposed to have an expansile pulsation. There are many saccular aneurysms with thick clots which show no evidences of an expansile pulsation.

Neurogenic tumors frequently appear in the mediastinum. Recognition is not easy. The diagnosis can be made when osseous changes are present, such as erosion or destruction of one or more pedicles

*The pathologist subsequently reversed his opinion and considered it as an aneurysm of the ascending aorta.

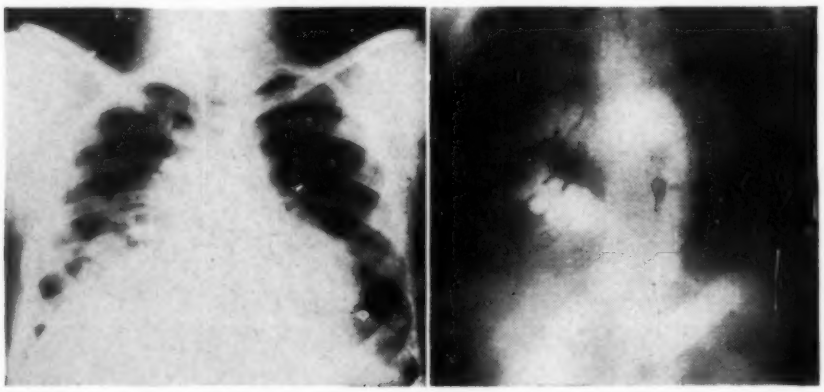
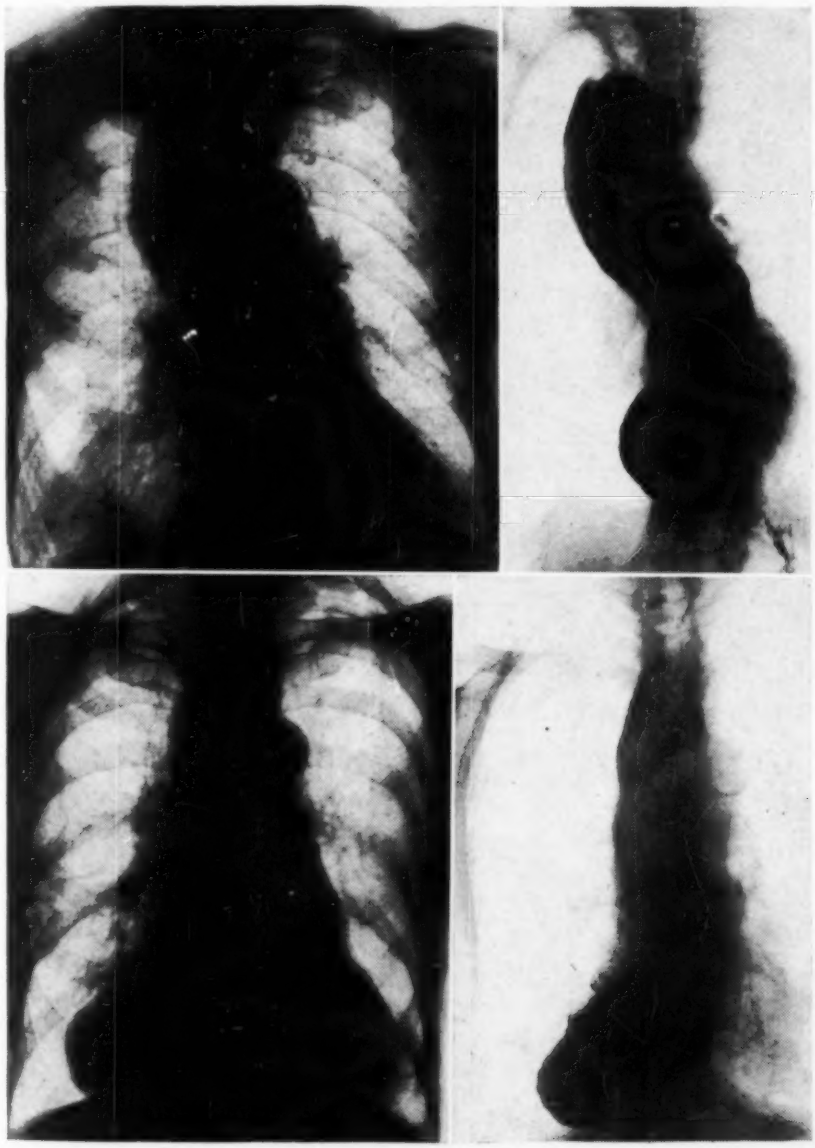


Fig. 7—Paracardiac shadow, right side. Diaphragmatic hernia.

of a vertebra and neighboring structure. Aneurysms also can and do destroy adjacent ribs and vertebrae. An osteogenic sarcoma arising from a vertebral portion of a rib may present similar manifestations. A mediastinal dermoid, without any evidences of teeth, may reveal itself by a stratification of its densities. Air in the mediastinum may be evident following a peri-renal insufflation. Mencher advocates that this procedure be utilized for outlining mediastinal new growths.



Figs. 8A and 8B—Widened superior mediastinum due to a tortuous and dilated oesophagus.

Figs. 8C and 8D—Paracardiac shadow right side due to a dilated and tortuous oesophagus.

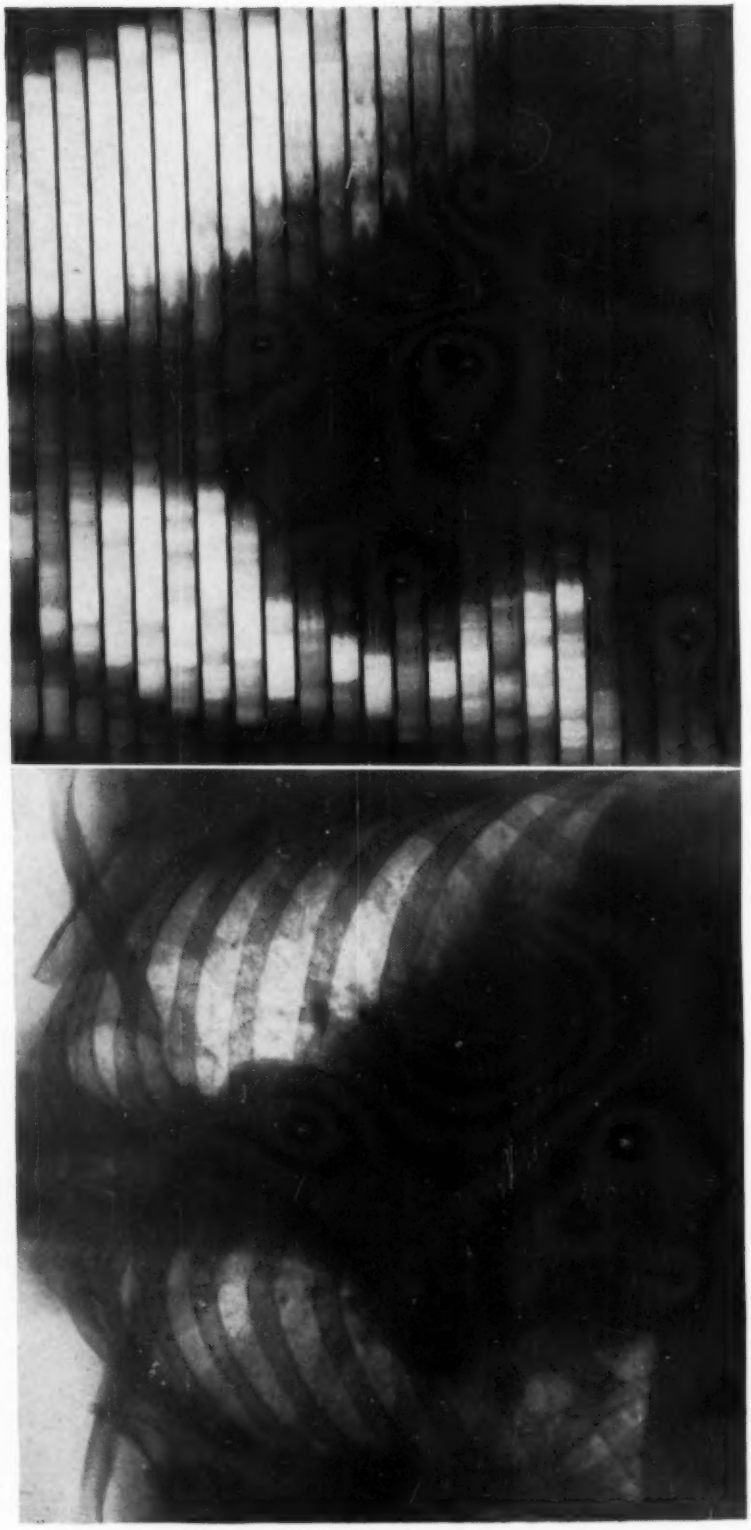


Fig. 9—Aneurysm of ascending aorta.

Planigraphic studies demonstrate lesions. Tumor masses, erosions, and destructive manifestations are clearly depicted. They can be localized, and this may be helpful in determining etiology. Planigraphy can be utilized to demonstrate clearly lesions in the thorax, including the clavicles and the thoracic cage. I recall a bilateral expanding lesion of the sternal ends of the clavicles which had to be differentiated from infiltrating parenchymal lesions.

Angio-cardiography demonstrates the cardiac chambers, large vessels, and pulmonary vessels. It is an excellent method for differentiating aneurysms from other mediastinal lesions, even though it is not infallible. Recently this method failed me in a case where multiple aneurysms were present, three arising from the arch and one from the descending aorta. Using all available diagnostic methods, the three at the arch were recognized. The lower one arising from the descending aorta was excluded as being an aneurysm, was

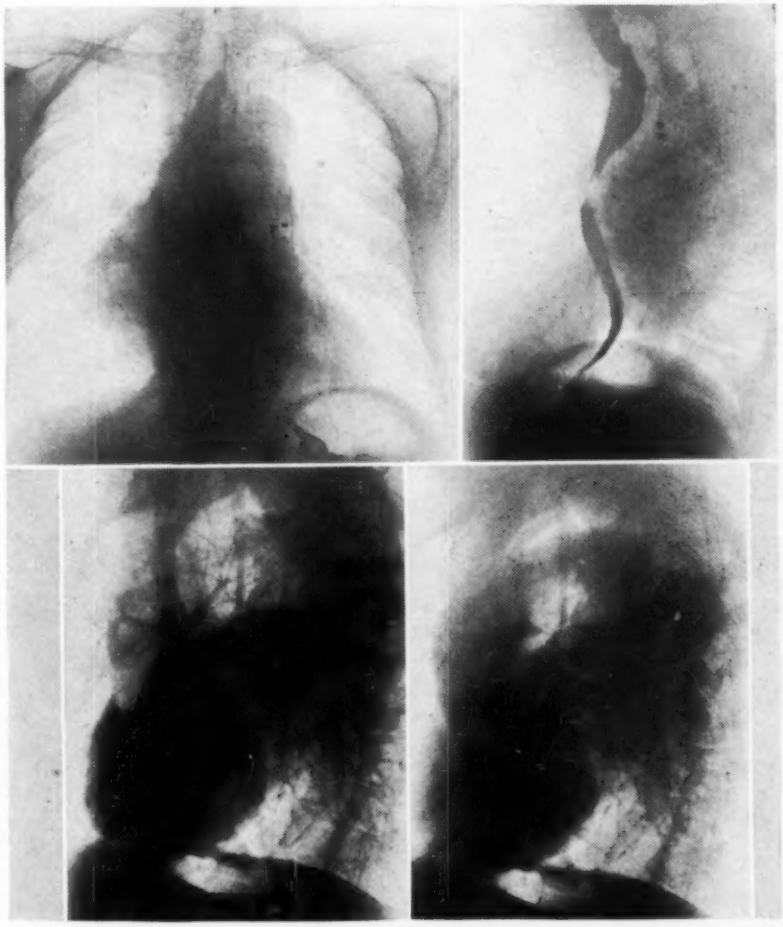


Fig. 10—Multiple aneurysms. Oesophagus displaced anteriorly and to the left by a mediastinal mass which proved to be an aneurysm of the descending aorta, which was not demonstrated by angio-cardiography

Fig. 8B—Endarteritis of pulmonary vessels demonstrated by angio-cardiography.

Fig. 11A—Pulmonary vessels demonstrated by angio-cardiography.

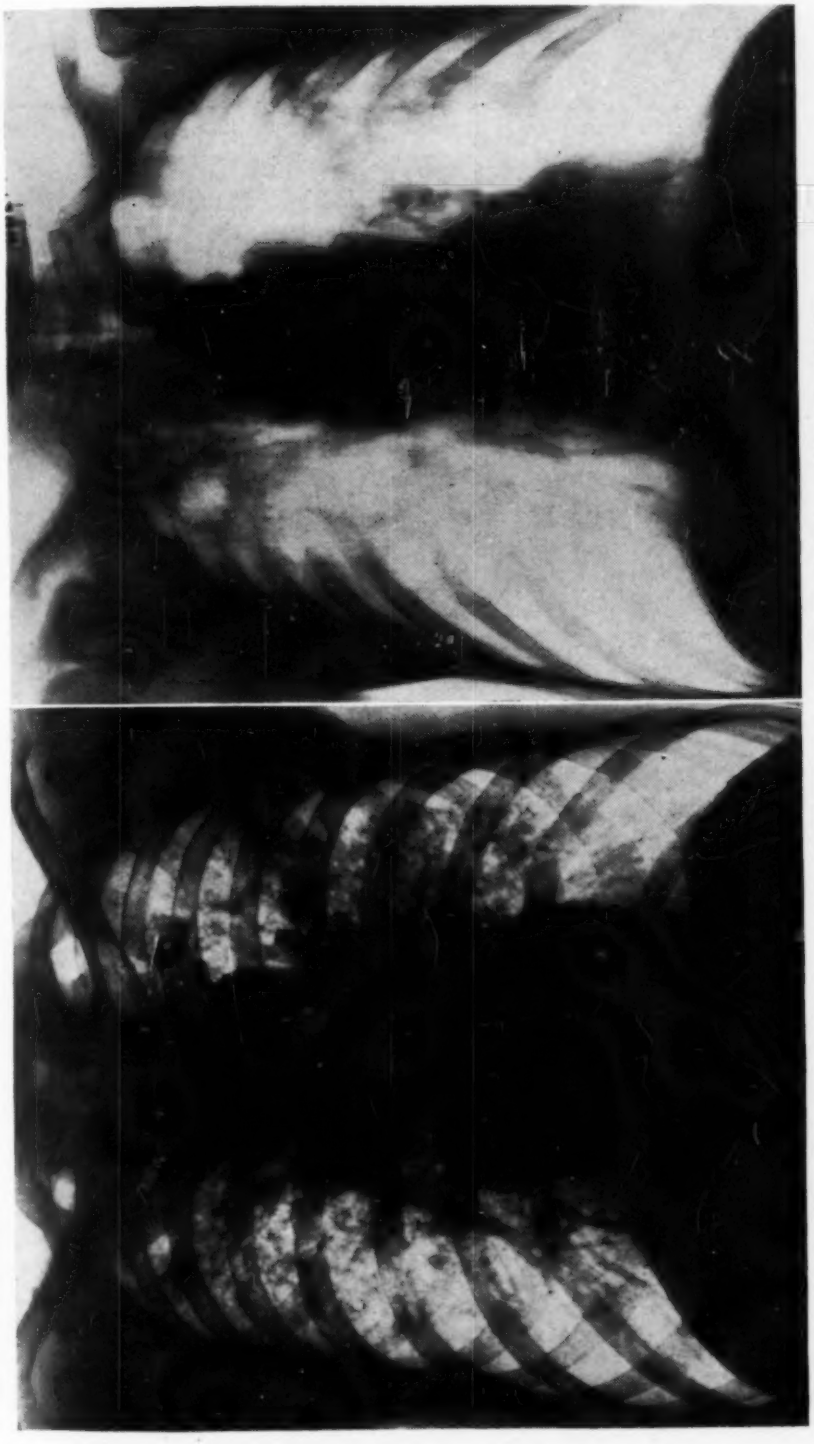


Fig. 12—Cavity in right upper lobe demonstrated on planigraphic examination.

complemented as a neurogenic tumor, only to be demonstrated by the pathologist some time later as a huge aneurysm with a massive clot.

An endarteritis of pulmonary vessels was demonstrated by angio-cardiography in a case where this was suspected clinically. With it there was also demonstrated an extensive intrapulmonary collateral circulation.

Angio-cardiography is an excellent method for demonstrating obstructive lesions in the superior vena cava, and associated collateral circulations in the chest wall and mediastinal structures; distorted and displaced vascular structures associated with retracted and displaced lungs either with disease or following surgery. It is an excellent method for the demonstration of anatomic structures.

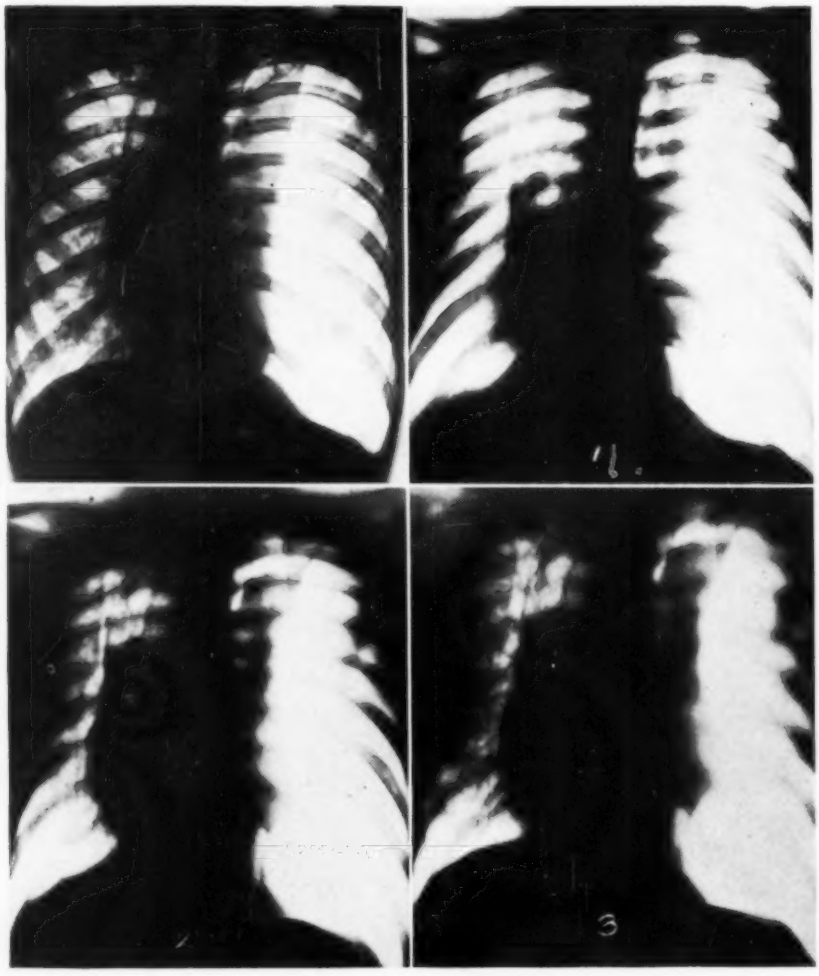


Fig. 13—Pneumothorax, left, with herniation. Left upper lobe adherent. Planigraphic examination reveals an unsuspected excavated lesion; exposes and localizes the adhesion; and demonstrates the level of the herniation.

Oddly enough, it fails to demonstrate a patent ductus arteriosus, a lesion amenable to surgery.*

The thoracic surgeon is aided when he is the recipient of positive information. I have already indicated assistance to the surgeon in cases of putrid lung abscesses. Localization for lobectomy or pneumonectomy is not difficult. In order to maintain an adequate and effectual pneumothorax in cases requiring severance of adhesions, if any are present, the localization of size, number, thickness, character and attachments of the adhesions is advisable if possible. While oblique examinations are helpful, a planigraphic study will yield considerably more useful information, particularly the anteroposterior length, width and character of the adhesions.

In cases where a thoracoplasty is under consideration, a planigraphic examination is mandatory. This will indicate not only whether the lesion is unilateral or bilateral, but also the character and location of the lesion or lesions. I can assure you of many surprises. The usual routine studies, the over-exposed, over-penetrated, and Potter-Bucky diaphragm studies, will not yield the same information.

The planigraphic study can definitely be used as a localizing method when the Monaldi method of cavity closure is to be tried.

A positive sputum in a post-thoracoplasty case often presents a difficult problem. The source for the persistence of the tubercle bacilli must be located. All types of examinations may yield little or no information. Planigraphic studies may reveal a distorted annular shadow which may have been a cavity. Knowledge of the original location, and calculation of displacemant may make for a tentative diagnosis of an open cavity. Other times the information may be more positive. As previously mentioned, a bronchographic examination after the instillation of a watery contrast substance may help to localize an open cavity. Sedation may help. An inconstant sign, described by Gordon, is a convexity to the regenerated rib overlying the open cavity. Aerated lung may give the same appearance. According to Davidson, residual post-thoracoplasty cavities are almost invariably located in the costovertebral gutter, at the level of the fourth intercostal space or fifth rib.

An interesting lesion for the roentgenologist is the one of oil aspiration pneumonia, particularly in the aged. A protracted bronchopneumonia in an individual who is debilitated, aged, has difficulty in swallowing, should be investigated for the intake of milk, medicated oils or mineral oil.

Fungus infections simulate tuberculosis, and cannot always be differentiated from oil aspiration pneumonia.

These conditions bring to mind the question of silicosis. A diag-

*Sussman and his co-workers have since demonstrated the site of a patent ductus arteriosus.

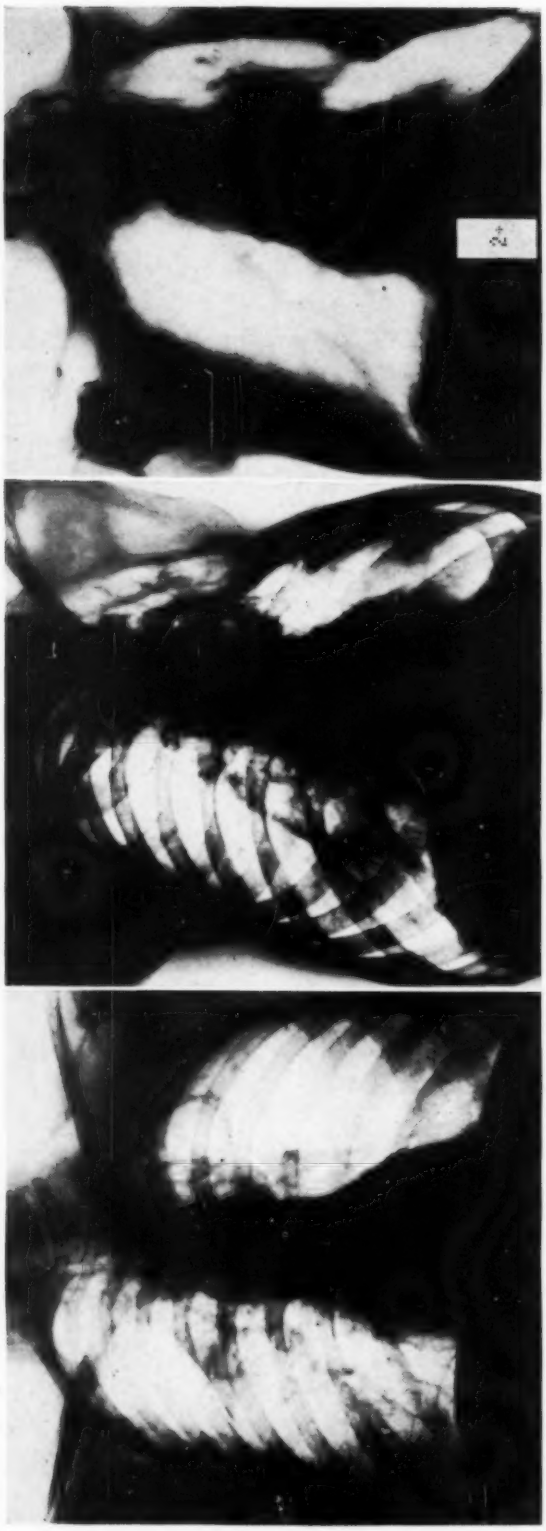


Fig. 14—Selective pneumothorax, right side. First stage thoracoplasty, left. Large cavity in subapical portion of left upper lobe. Two stage thoracoplasty. Cavity not visualized. Positive sputum persisted. Planigraphic examination reveals irregular annular shadow—uncollapsed cavity.

Fig. 15—Tumor involving the manubrium. Planigraphic examination discloses the character of the lesion.

nosis is not made in the absence of positive x-ray findings. The diagnosis from the roentgen standpoint should not be made unless there is an adequate occupational history.

A group of lesions resembling one another, and sometimes difficult of differentiation from the roentgen standpoint are: intense congestion, oil aspiration pneumonia, silicosis, chronic productive type tuberculosis, a bronchogenic spread of a tuberculous process from a ruptured caseating node, miliary tuberculosis and miliary carcinosis.

The roentgen findings in silicotics may be simulated by other conditions. I have seen excavated lesions in silicotics and interpreted the lesion as a tuberculous process superimposed upon a silicosis. In several of these cases, postmortem studies revealed non-tuberculous excavations in silicotics. How many times this has occurred cannot be stated. It does bring to mind, however, that excavated lesions should not be called tuberculous in the absence of a positive sputum or a definite history.

An incomplete roentgen examination may also be misleading in that an infiltrating lesion observed in the postero-anterior projection which would ordinarily be described as being within a given area, might, upon a more complete examination, prove to be elsewhere. A lesion considered as being in the basal and axillary portion of the right upper lobe might surprise both the clinician and the roentgenologist by being located in the accessory lobe corresponding to the apical portion of the right lower lobe.

Recognition of interlobar and mediastinal effusions, as well as pleural plaques, requires more than one projection. Fluoroscopy is of considerable help.

Expanding sternal lesions, neoplasms, are not clearly depicted by any of the usual roentgen procedures. Planigraphic studies are required to isolate and demonstrate the intrinsic characteristics of the lesions.

Pathological processes obscured by superimposed structures may be better demonstrated by some other technical procedure. A shortened target film distance results in marked distortion of superficial structures and may eliminate them. An examination made with the patient breathing will eliminate some of the ribs superimposed over the spine, sternum, and even the opposite ribs. This procedure may be utilized to augment planigraphic studies, in certain locations only.

The wiring of aneurysms is excellently demonstrated on any of the roentgen procedures. The wiring of an aneurysm can be accomplished without roentgen study, but its accomplishment would be unknown, and unsettled in the mind of the surgeon unless a roentgen examination were made.

I could go on and on in this fashion and even show where some

of the simpler conditions in the lungs play tricks and fool us. Time does not permit, and the intention of this presentation is not to cover all diseases, but to show where the role of the roentgenologist fits into the diagnosis of thoracic diseases.

SUMMARY

It is the opinion of the author that, for varied reasons, there will ultimately occur a "displacement or perhaps replacement of the roentgenologist." However, until such time arrives the roentgenologist plays many important roles. He must have a thorough knowledge of pathology. His proficiency in introducing iodized oil into the tracheobronchial tree can be very helpful in the diagnosis of many pulmonary conditions. Lateral and oblique projections and biplane fluoroscopy can be a great aid in localizing abscesses, tumors and foreign bodies. Planigraphic studies are also valuable. Angiocardiography will give excellent demonstration of anatomic structures. Adequate x-ray studies and interpretations will aid greatly in the diagnosis of many obscure or unusual intrathoracic conditions. Fifteen illustrations of interesting conditions demonstrated by x-rays are included.

RESUMEN

Opina el autor que, por razones varias, al fin y al cabo "se eliminará o quizás se reemplazará al roentgenólogo." Sin embargo, mientras que ese tiempo llegue el roentgenólogo desempeña un papel muy importante. El necesita tener un conocimiento completo de la patología. Su abilidad en introducer aceite yodado en el árbol traqueobronquial sirve de gran ayuda en el diagnóstico de muchas condiciones pulmonares. Roentgenografías laterales y oblicuas y la roentgenoscopía en dos planos pueden dar gran asistencia en localizar abscesos, tumores y cuerpos extraños. Roentgenografías tomográficas también son útiles. La angio-cardiografía muestra las estructuras anatómicas en forma excelente. Competentes examenes e interpretaciones roentgenográficas son muy útiles en el diagnóstico de muchas condiciones intratorácicas oscuras o raras. Acompañan a este artículo quince ilustraciones de condiciones interesantes probadas por los rayos X. *667 Madison Avenue.*

Discussion

BARTON R. YOUNG, M.D.*
Philadelphia, Pennsylvania

Doctor Taylor indicated some difficulties that confront us in the diagnoses of chest diseases and presented not only routine roentgen procedures but also a number of special methods of roentgen exami-

*Temple University Medical School.

nation that are helpful in the solution of these diagnostic problems. An additional procedure that is very useful in arriving at a diagnosis is aspiration biopsy. Our success at Temple University Hospital in obtaining satisfactory tissue for histologic study is in no small part due to adequate fluoroscopic guidance, made possible by the use of the Chamberlain biplane fluoroscope. It is so well engineered that the fluoroscopist is able to accurately guide the surgeon's aspiration needle into any part of the lung, even though it be abnormally dense. In dealing with otherwise inaccessible lesions, aspiration biopsy frequently results in a positive diagnosis when all other methods short of surgical exploration fail.

Although not infallible, the test of irradiation is a worthwhile diagnostic aid when one of the lymphoblastoma is suspected and there are no accessible regional lymph nodes for biopsy. A dose of 100 r, or even less, to the front and back of the lesion twice a week for three weeks is usually ample to produce considerable diminution in size of a neoplasm belonging to this group.

The value of planigraphy to demonstrate obscure lesions in the chest cannot be overemphasized, and I want to endorse everything Doctor Taylor said about this special type of examination. During the past few years we used planigraphy in every chest problem that was not solved by non-planigraphy studies, with the result that many disease processes were diagnosed and properly evaluated when otherwise they would have remained obscure. Many of our more spectacular successes were obtained with tumors located near or in dense lung tissue that could not be demonstrated by ordinary methods. Not only is the shadow of a tumor differentiated from that produced by surrounding dense tissue, but in some instances the neoplasm is sharply localized so that aspiration biopsy is feasible. We were equally successful in the visualization of unsuspected tuberculous cavities either before, during, or after collapse therapy.

Planigraphy is also useful in the localization of foreign bodies in the chest, especially when the foreign body is demonstrated by only one projection, as the postero-anterior, but not by the lateral because of foreign body atelectasis or adjacent pneumonitis. In such a case, it is possible to determine the depth of the foreign body and to ascertain its relation to the nearest bronchial division of appreciable size by body section roentgenography.

We are indebted to Doctor Taylor for placing before us some pitfalls in roentgen diagnosis and also for calling our attention to the many ways that roentgen rays are utilized not alone for the recognition of diseases of the chest but as an indicator of the course of a disease during its treatment. As he has pointed out, the rays are used most effectively when there is close cooperation between chest physician and roentgenologist.

Extrapleural Pneumothorax—Prejudices and Facts

DONATO G. ALARCON, M.D.*
Mexico City, D. F.

In the treatment of pulmonary tuberculosis temporary and permanent collapse have their indications, depending on the age of the lesions, the anatomical substratum of disease, and even on the social condition of the patient. Also, the indications for temporary collapse are subject to the practical possibilities of performing each procedure.

We are not going into an extensive discussion of temporary versus permanent collapse. Yet we do want to stress the point that, in general, the surgeons who advocate radical methods as preferable in the treatment of tuberculosis of the lungs are not the real pthisiologists. Clinicians who observe their patients for several years and even for decades know that temporary methods are by far more humane and their results more gratifying if circumstances permit one to defer the utilization of radical procedures, and to employ properly the less radical methods.

When clinical experience is backed by sound surgical training, the best conditions are obtained for the benefit of patients. The ideal of today is the phthisio-surgeon; that is, the man who is able, through long experience in caring for these unfortunates, to evaluate, select and administer every kind of therapy—immunobiologic, social, hygienic, medical, gaseous collapse, and such surgical procedures as may be necessary at any time.

Between the temporary and the permanent methods there was at one time a considerable gap in possibilities. When we were confronted by a case of pulmonary tuberculosis in which, though pneumothorax was indicated, extensive adhesions or the total adherence of the lung prevented the use of that method, we were compelled to employ the permanent surgical procedures just on account of the practical impossibility of creating a gaseous chamber around the lung by means of a needle.

There was scarcely a specialist who had not considered the possibility of creating a chamber outside the adherent pleura. Every one of us had thought about this way of solving the problem, but every one of us had refrained from attempting an extrapleural pneumothorax, thus becoming the victims of a prejudice. Because of this, our patients were deprived of the benefits of a logical substitute for intrapleural pneumothorax.

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*Medical Director of the Tuberculosis Sanatorium of Public Welfare, Mexico City.

We were victims of the high authority of Sauerbruch, Tuffier and others who claimed that extrapleural pneumothorax was a surgical failure. Sauerbruch[1] condemned the method with these words: "From the surgical viewpoint this method today does not deserve any consideration." Tuffier was unable to maintain extrapleural pneumothorax, and his experience has been costly to tuberculous patients who might have had the benefit of this procedure.

Against that prejudice, well-meaning surgeons stumbled and withdrew until the work of Graf and Schmidt became known and prejudice was attacked by facts.

Thoracoplasty is certainly a most important and decisive method of collapse treatment. The writer has performed around five hundred stages; and his statistics are very gratifying, as are those of any surgical center in the world. But we have longed for a procedure to fill the gap between intrapleural pneumothorax and thoracoplasty. Plombage sometimes fills that gap, and it has been used in our institution with satisfactory results.

Although thoracoplasty has attained a technical perfection which allows us to expect functional restoration of the shoulder and a fairly aesthetic appearance of the chest, no one discusses, if things are considered from the patient's point of view, how dreadful it is for him to face the decision for such a demolishing operation. Moreover, sometimes it is impossible to avoid a deformity and to prevent asymmetry, results which are a matter of concern to patients, particularly to women, for whom, frequently, their whole future depends on their physical appearance. Even in view of

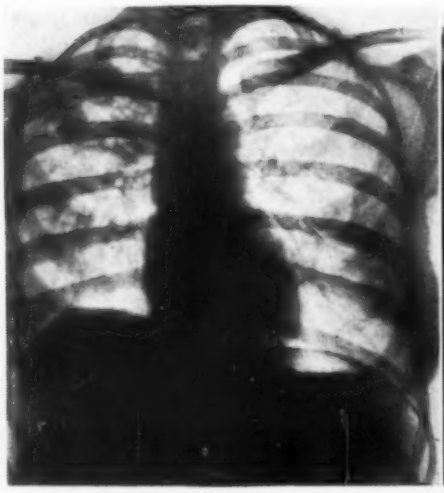

Figure 1

Figure 2

Fig. 1—Caseopneumonic tuberculosis of entire right upper lobe. Intrapleural pneumothorax impracticable on account of pleural synechia. Typical indication for extrapleural pneumothorax.

Fig. 2—Same case as Fig. 1, after operation. Extrapleural pneumothorax producing satisfactory selective collapse. Sputum consistently negative.

obtaining the best results, no one can convince an individual that with a thoracoplasty he will not be crippled for the rest of his life, morally if not physically.

There is no way to avoid thoracoplasty when it is definitely indicated; but we are advocating the use of other means before thoracoplasty, if this procedure is contemplated as a substitute for some non-feasible form of temporary collapse. Opposing the old prejudice of impracticability of extrapleural pneumothorax are the facts of hundreds of technically successful cases already reported. Other objections which are prejudicial also are overruled by our experience.

IMPOSSIBILITY OF MAINTAINING THE GASEOUS CHAMBER SUFFICIENTLY LONG

Experience has shown us how to maintain the extrapleural space successfully for a longer period of time. So far, after five years' experience, we have cases in which it has been possible to keep an extrapleural space for over four years, which is a fairly good duration for a temporary collapse. And this is by no means the attainable limit, in our opinion. The tendency of the space to obliterate is prevented by three means: The use of high pressure when it is properly indicated, which means not too early and not too late; a short interval between refills; and, most important of all, extensive decollement surpassing the apparent need in order to compensate for the unavoidable diminution of the space. An extrapleural space may lose a quarter or a third of its volume. We make it a third larger than seems necessary, and we are well satisfied with the results.

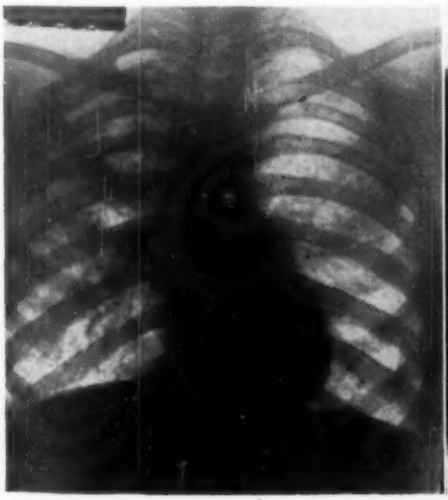

Figure 3

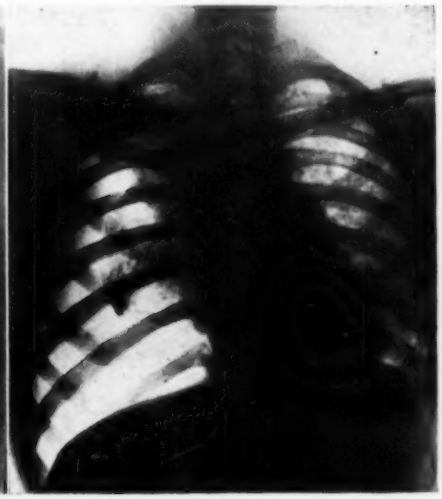

Figure 4

Fig. 3—Caseopneumonic lesions involving all lobes of the right lung.
Fig. 4—Same case as Fig. 3. Intrapleural pneumothorax collapsing only the lower and middle lobes. Sputum positive.

INFECTION IS VERY FREQUENT AND THE EXTRAPLEURAL SPACE IS LOST FROM THIS CAUSE

In our experience, among 71 cases operated prior to January, 1942, only five became infected and only one of these was an infection with the tubercle bacillus. In three cases the infection was overcome and the final result was satisfactory. We now use sulfanilamide routinely during the first three days after the operation, with the result that cases of infection are really rare.

LUNG PERFORATION IS A FREQUENT POSSIBILITY

The observance of two rules makes perforation an exception, and certainly less frequent than in intrapleural pneumothorax. The lung may be handled gently; and dissection must not be continued through dense extrapleural fibrosis. One must be completely aware of the danger and risk to the integrity of the lung if he insists on creating a space where such fibrosis exists. The surgeon must be prepared to substitute thoracoplasty for any planned extrapleural pneumothorax in case of extreme difficulty, and the patient must be informed and must accept beforehand any change in tactics during the operation. This attitude on the part of the surgeon is very reassuring for patients.

PATIENTS' OBJECTIONS

There are other objections depending on the attitude of patients. Medical prejudices are known and shared by informed patients,

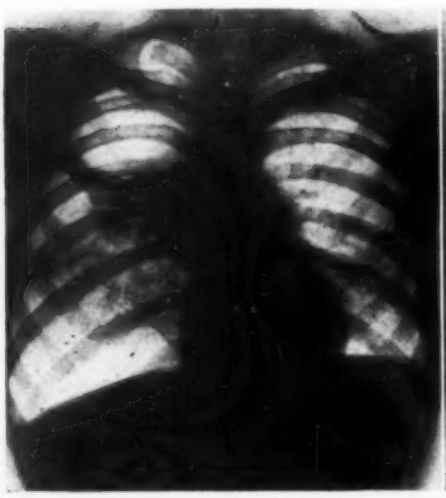

Figure 5

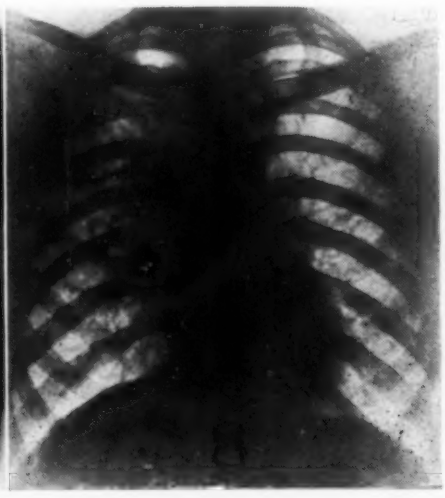

Figure 6

Fig. 5—Same case as Fig. 3. An extrapleural pneumothorax is created independently for the upper lobe. This is an example of combination of both methods. Sputum consistently negative.

Fig. 6—Fibrocaseous lesions and big cavity under the clavicle. There are exudative lesions in the middle and lower lobes.

some of whom want their intrapleural pneumothorax to be discontinued and demand an operation such as thoracoplasty. This attitude should be modified by educating the patient to see the actual comparative results of the various procedures.

Refills are painful when the Schmidt technique is used. Because our spaces are extensive, refills can be made through the axilla with no more pain than is caused by an intrapleural refill.

Feasibility, infection, fistulization and pain, whether prejudices or facts, as a basis of objection to the utilization of extrapleural pneumothorax are no longer valid, in our opinion.

ADVANTAGES OF EXTRAPLEURAL PNEUMOTHORAX VS. THORACOPLASTY

Temporary collapse by this method is possible for recent lesions which cannot be treated satisfactorily by intrapleural pneumothorax because of adhesions. There is no deformity. Scars are less extensive and less conspicuous.

It is possible to make a real selective collapse, since one is able to detach the lung as far as necessary and to avoid decollement elsewhere. The collapse is "modelled" in each case, as it cannot be done in thoracoplasty. The latter operation sacrifices pulmonary areas where collapse is not desirable, and vital capacity is diminished permanently by collapsing healthy pulmonary tissue.

When thoracoplasty is performed, the last straw of possibilities is

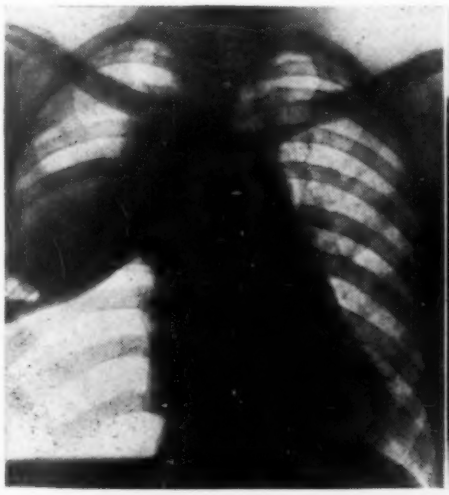

Figure 7

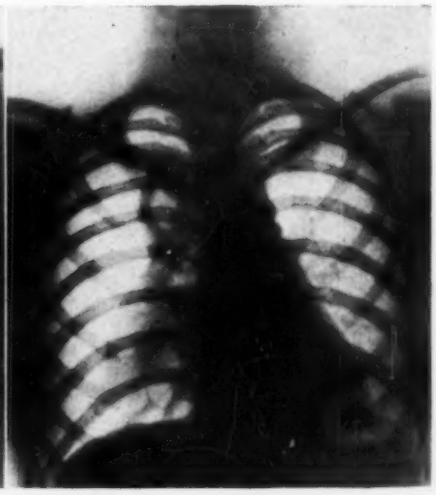

Figure 8

Fig. 7—Same case as Fig. 6, after combination of extrapleural and intrapleural pneumothorax, leaving both independent. Selective collapse; sputum negative. Re-expansion shows recently a complete healing. Case followed four years.

Fig. 8—Ineffectual intrapleural pneumothorax. Five pleuroscopies attempting to sever all adhesions failed to improve collapse. The lung was extensively adherent to mediastinum and blood vessels.

thrown away, with only tremendous revisions as a recourse in case of failure. When extrapleural pneumothorax fails, we still have thoracoplasty to fall back on, which is less shocking after the former procedure, as experience demonstrates.

ADVANTAGES OF EXTRAPLEURAL VS. INTRAPLEURAL PNEUMOTHORAX

Extrapleural pneumothorax has possibilities surpassing those of intrapleural pneumothorax. When the latter is begun no one knows whether it will be successful. Its selectivity is unpredictable on account of the chance of adhesions which in a high proportion of cases are inoperable. Flexibility of the mediastinum frequently prevents a satisfactory collapse of the lung by intrapleural pressure. In making the extrapleural space, one is able to leave some points of attachment which will prevent shifting of the mediastinum when such displacement is not desirable.

High pressures are by far more practicable with extrapleural pneumothorax than with intrapleural, because of the above mentioned features. Danger of perforation of the lung in intrapleural pneumothorax is enormously greater than in extrapleural, because in the latter the lung is fixed by the limits of decollement. Air embolism is a possibility in extrapleural pneumothorax as in intrapleural; but so far we have not had any fatal case.

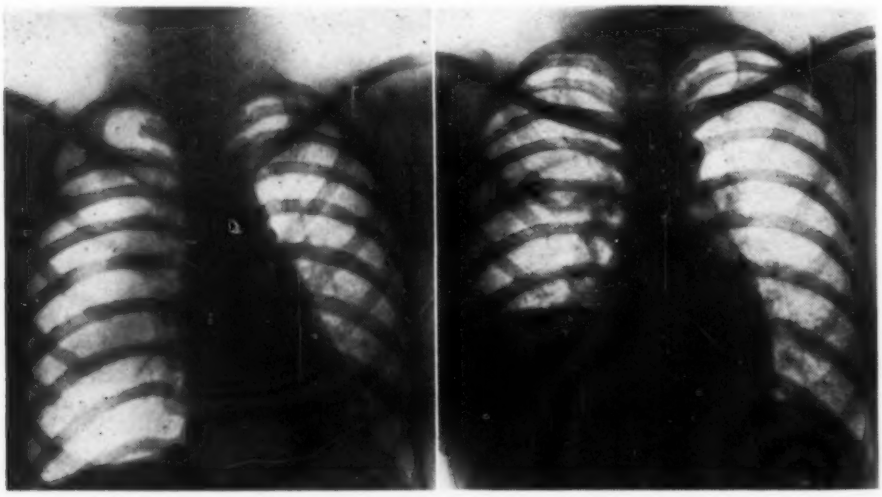

Figure 9 Figure 10

Fig. 9—Same case as Fig. 8. Apex was liberated extrapleurally; pleura was opened at once all around the limit of decollement. Complete collapse was obtained. Sputum became negative immediately. Pneumothorax still maintained after 2 years.

Fig. 10—Extensive cavity near the Hilus. After phrenectomy the diaphragm rose but failed to close the cavity within a year. Sputum positive. This would be an indication for extensive or total thoracoplasty were it not for extrapleural pneumothorax.

EXTRAPLEURAL COMBINED WITH INTRAPLEURAL PNEUMOTHORAX

When intrapleural pneumothorax leaves some lesions unaffected and when a Jacobeus is very difficult or not practicable (as in the case of extensive adhesions on the whole upper lobe or adhesions to the mediastinum and great vessels) an extrapleural pneumothorax is possible and can be combined with an intrapleural, either communicating or independent. This technique is particularly interesting; risk to the lung is minimal, the great vessels are not endangered, and the collapse is converted to selectivity. This method is not to be confused with that of open intrapleural section of the adhesions. In attacking the adhesions extrapleurally the pleura is not open until the last moment. No blood is allowed to enter the cavity, mediastinal attachments can be freed as far down as is anatomically possible, and falling away of the apex is massive.

RESULTS

So far we have performed 72 extrapleural pneumothoraces with the following results:

Patients converted to negative sputum	36
Patients not converted to negative	21
Died	15
Total	72

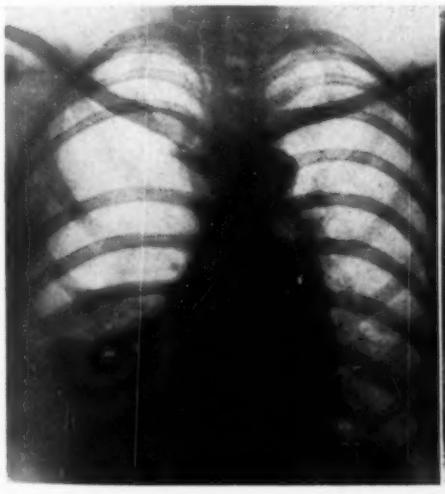

Figure 11

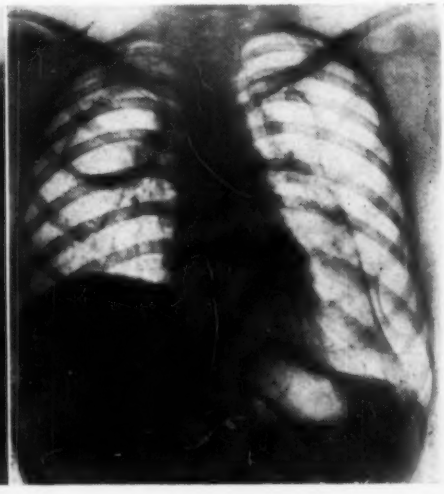

Figure 12

Fig. 11—After extrapleural pneumothorax a complete collapse is obtained with closure of the cavity and conversion of sputum. Collapse still maintained three years after operation. Patient leads a normal life.

Fig. 12—Bilateral tuberculosis; intrapleural pneumothorax on the left side. Phrenectomy on the right fails to modify the enormous cavity seen under the clavicle.

It is important to notice that among those not converted are patients still under care at the Sanatorium and several very recently operated whose final outcome is not yet definite. Also it is important to consider the fact that only one death was attributable to the operation. The other fourteen were cases of far-advanced disease in which the operation was employed as an auxiliary measure, as can be seen in several of the cases illustrated. As a matter of fact, when the extrapleural pneumothorax is technically successful according to the requirements already stated, conversion of the sputum is the rule.

CHANGE FROM EXTRAPLEURAL PNEUMOTHORAX TO OTHER PROCEDURES

To extrapleural oleothorax	7
To thoracoplasty	2
Discontinued early	12

Four of the twelve discontinued cases remained negative, being practical successes though technical failures.

Fistulization occurred as follows:

Extrapleuro-cutaneous fistula	5
Broncho-cutaneous fistula	2

Among cases operated over a year ago results are:

Negative sputum	62%
Positive sputum	38%

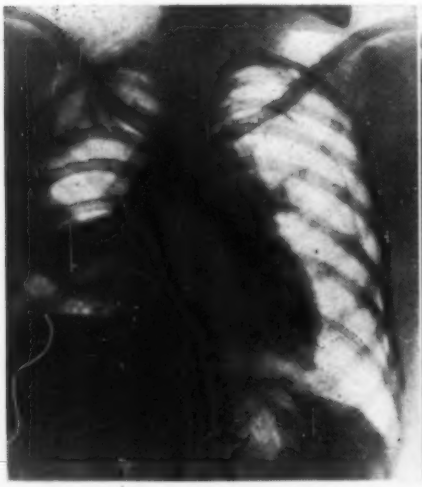

Figure 13

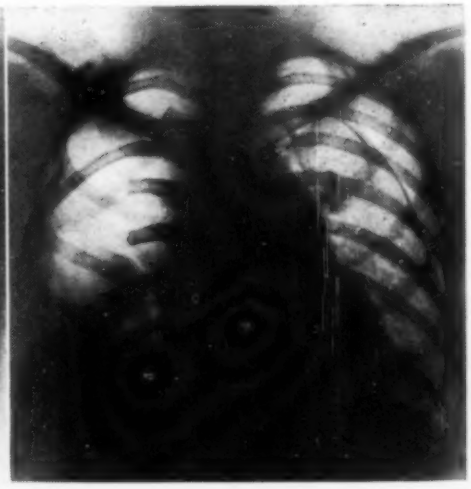

Figure 14

Fig. 13—Same case as Fig. 12. While continuing the left intrapleural pneumothorax, an extrapleural pneumothorax is established on the right. Lesions are partially collapsed but not satisfactorily.

Fig. 14—Same case as Fig. 12, after a second stage of extrapleural pneumothorax which improved the collapse on the right side. Pneumothorax maintained on the left side. Patient did not show any signs of exceptional distress; after 5 days could walk to the fluoroscope.

Several of our cases were in such condition that thoracoplasty could not be contemplated. Extrapleural pneumothorax, being more tolerable, was employed as a temporary measure. This circumstance, of course, makes the final mortality much higher than it would be if the operation were attempted only in unilateral or fairly early cases.

In any case, every successful extrapleural pneumothorax reported is a patient saved from thoracoplasty and given the benefits of temporary collapse.

Amazonas 96
Mexico City.

REFERENCES

1 Sauerbruch, F.: *Cirugía del Tórax,* 1926, p. 803.

ADDENDUM

Since February 1942, 28 additional cases have been operated. Results of these 28 cases are as follows:

Deaths 1

This patient died from heart failure three months after the operation done in two stages. She had caseous pneumonia very extensive.

Change to thoracoplasty 1

Infected (extrapleuro-cutaneous fistula) 2

These two have already healed from their fistula.

Negative 19

Positive 5

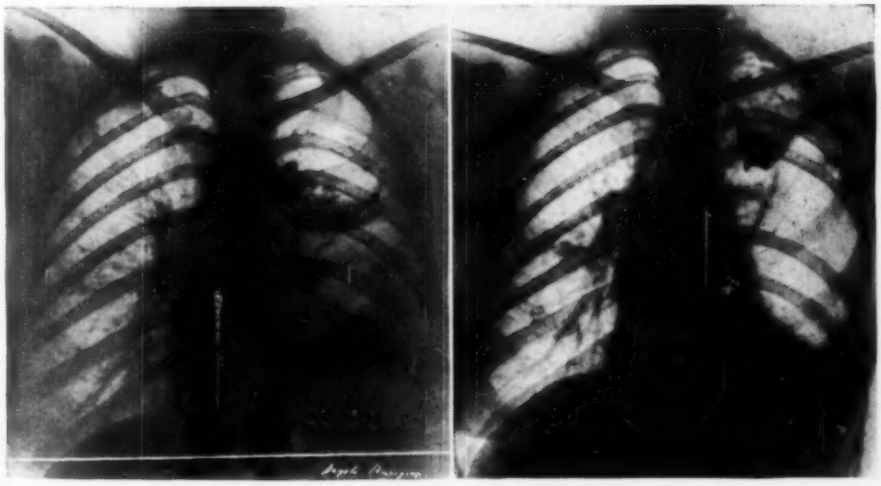

Figure 15 Figure 16

Fig. 15—Extrapleural pneumothorax on left, lipiodol showing the limit. Extensive shadow in the base. Auscultation revealed rales in the lower lobe. Sputum positive.

Fig. 16—Same case as Fig. 15. Upper extrapleural pneumothorax was discontinued. A new extrapleural space is created independently below the former.

The positive cases are as follows:

With extrapleuro-cutaneous fistula, already closed, but the extrapleural pneumothorax being lost 1
With extrapleural intrapleural-cutaneous fistula recently operated 1
With empyema 1
With insufficient collapse 1

These new cases bring our statistics to the following numbers so far:

Negative sputum 55
Not converted 26
Died 16

It is noteworthy that 4 out of 5 with extrapleuro-cutaneous fistula healed from the fistula by the local use of sulfathiazole and surgical closure. Three of these complicated cases nevertheless became negative.

RESUMEN

En el tratamiento de la tuberculosis pulmonar el colapso temporal y permanente tienen sus respectivas indicaciones, dependiendo de la edad, de las lesiones anatómicas y condiciones sociales del enfermo, así como de las posibilidades prácticas. Entre los métodos de colapso temporal (neumotórax) y los de colapso permanente existía un gran espacio de posibilidades que no se había llenado satisfactoriamente.

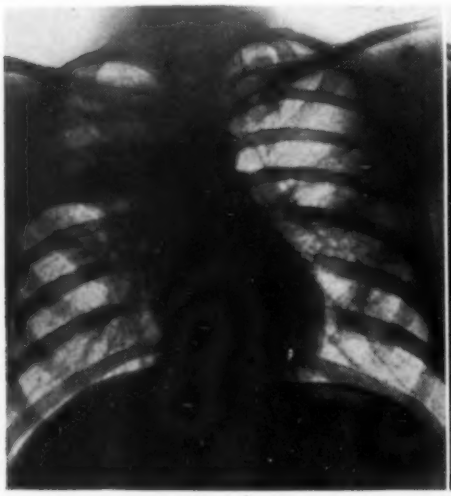

Figure 17

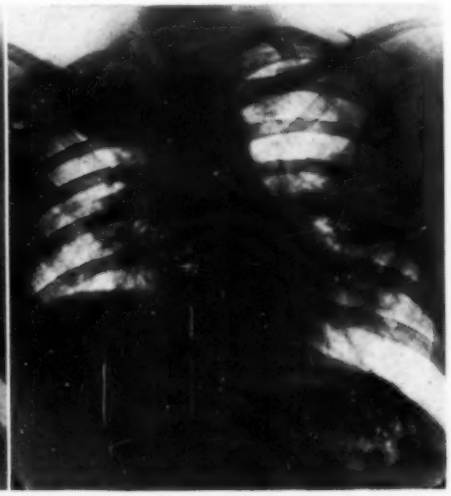

Figure 18

Fig. 17—Tuberculosis involving entire right upper lobe, with cavitation. There are caseopneumonic lesions in the left lung. Patient in very poor condition; also had intestinal and renal tuberculosis.

Fig. 18—Same case as Fig. 17. Tactics were: (1) phrenectomy, which diminished the size of the right upper lobe; (2) plombage, which collapsed the upper lobe satisfactorily.

En presencia de un caso que por su naturaleza anatomo-clinica necesitaría neumotórax intra-pleural pero en el que desgraciadamente adherencias extensas impedían la realización de este método, a pesar de la intervención de la sección de adherencias, nos veíamos obligados a recurrir a la toracoplastía.

Casi todos los tisiólogos pensaban en la posibilidad de crear una cámara gaseosa alrededor de las pleuras adheridas, pero retrocedían ante el conocimiento del fracaso de algunos cirujanos en años anteriores.

Las opiniones de Sauerbruch y Tuffier entre otros, proclamaban que el neumotórax extra-pleural era un fracaso.

Fué cuando el trabajo de Graf y Schmidt se conoció, que este prejuicio fué atacado por los hechos.

Es cierto que la toracoplastía es el más importante y decisivo de los métodos de colapso.

El autor declara que ha practicado alrededor de 500 tiempos de esa operación y que sus estadísticas son como las mejores, pero en su afán de encontrar un método para salvar a los enfermos a quienes no se podía hacer neumotórax intra-pleural por sinequia y con el objeto de evitarles la toracoplastía, recurrió al neumotórax extra-pleural con éxito.

Si bien la toracoplastía ha llegado a tal perfección que la restitución funcional del hombro y la recuperación estética son generalmente buenos, desde el punto de vista del enfermo, aun es una operación temible por su acción demoledora.

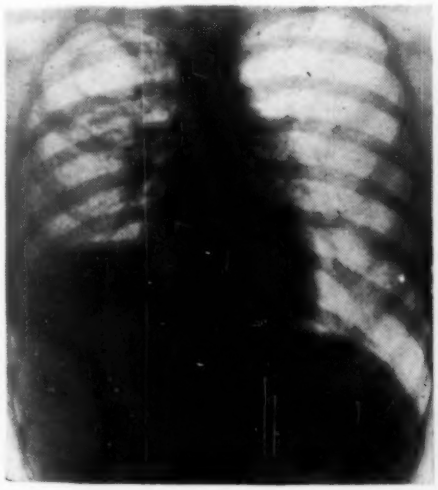

Figure 20

Figure 19

Fig. 19—Same case as Fig. 17. (3) An extrapleural pneumothorax was created on the left lung. Pulmonary lesions improved and sputum became persistently negative. This patient died later from the tuberculous enteritis.

Fig. 20—Caseopneumonic lesions on the right upper lobe, and middle lobe. Cavitation.

Además, es imposible evitar la deformación a veces, o evitar la asimetría.

Estas consideraciones son de gran importancia más en las mujeres que en los hombres, pero en todos los casos, nadie puede convencer a un individuo de que la toracoplastía no habrá de dejarle baldado para el resto de su vida si no en lo físico, en lo moral.

La toracoplastía conserva sus indicaciones definidas, pero debe intentarse neumotórax extra-pleural siempre que se suponga que el colapso temporal por tres o cuatro años puede bastar.

Las objeciones que se han hecho al método son contestadas por el autor de la manera siguiente:

IMPOSIBILIDAD DE MANTENER LA CAMARA GASEOSA POR TIEMPO SUFICIENTEMENTE LARGO

La experiencia ha mostrado al autor cómo puede mantenerse por muy largo tiempo la cámara gaseosa. Relata que tiene casos de cuatro años de duración en los que se mantiene el neumotórax extra-pleural y cree que se puede mantener aún más.

La reducción del volúmen del neumotórax extrapleural original se compensa técnicamente creando neumotórax más extensos de lo que se necesita aparentemente.

LA INFECCION ES MUY FRECUENTE Y EL NEUMOTORAX EXTRAPLEURAL SE PIERDE POR ESTA CAUSA

Muy pocos casos, (5 de 71, en la primera serie, 3 de 28 en la segunda serie), se han perdido por esta causa.

La infección ha sido dominada en 5 de 7 casos.

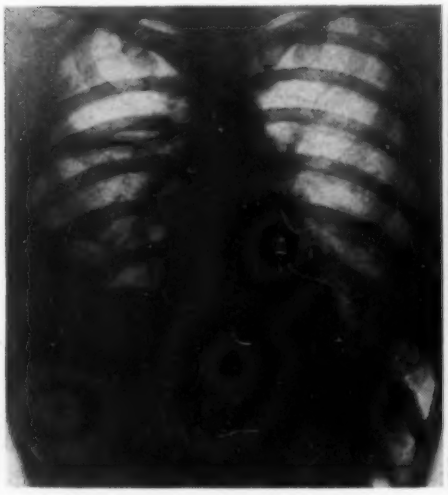

Figure 22

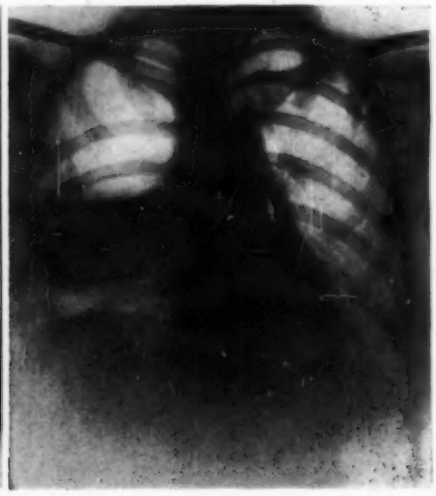

Figure 21

Fig. 21—Extrapleural pneumothorax was done on Nov. 4, 1938, with good result.
Fig. 22—Same case as Fig. 21. After four years, extrapleural pneumothorax is kept at about the same volume.

El uso de sulfamidas por la vía oral y local tiene una influencia decisiva para resolver estos casos.

LA PERFORACION DEL PULMON ES UNA FRECUENTE POSIBILIDAD

En 100 casos el autor sólo ha tenido tres de fístula bronco-cutánea. Sostiene que manejando con suavidad el pulmón y retrocediendo oportunamente cuando el neumotórax sea muy difícil, cambiando entonces a toracoplastía inmediatamente, se evita la perforación pulmonar.

OBJECIONES POR PARTE DEL ENFERMO

Fuera de los prejuicios del enfermo que pueden ser dominados por la persuación, existe la renuencia a sujetarse al tratamiento por el dolor que causan las re-insuflaciones.

Desde que el autor hace neumotórax extensos que son fáciles de reinsuflar por la axila, ha desaparecido esa objeción.

VENTAJAS DEL NEUMOTORAX EXTRA-PLEURAL FRENTE A LA TORACOPLASTIA

El colapso temporal por el primer método es posible en lugar del definitivo cuando las lesiones son recientes.

No hay deformación. Las cicatrices son menos extensas y menos notables.

Es posible hacer colapso selectivo puesto que el pulmón se despega precisamente donde es necesario. El colapso verdaderamente se "modela," lo que no puede hacerse con la toracoplastía.

La toracoplastía es irreversible. Cuando fracasa el neumotórax extra-pleural queda aun el recurso de la toracoplastía.

VENTAJAS DEL NEUMOTORAX EXTRA-PLEURAL FRENTE AL INTRA-PLEURAL

El despegamiento intra-pleural está sujeto al azar, dependiendo de la existencia de adherencias en lugares imprevistos.

La flexibilidad del mediastino impide a veces buen colapso por la presión intra-pleural.

El neumotórax extra-pleural permite dejar puntos de fijación que impiden el desplazamiento del mediastino cuando ésto no es deseable.

Las presiones altas son mucho más aplicables con el extra-pleural.

El peligro de la perforación del pulmón en el extra-pleural es much menor que en el intra-pleural.

La embolia gaseosa es posible en ambos procedimientos, pero no ha tenido un solo caso mortal en su serie de extra-pleural.

NEUMOTORAX EXTRA-PLEURAL COMBINADO CON INTRA-PLEURAL

Cuando un neumotórax intra-pleural deja lesiones no colapsadas y una operación de Jacobeus no es practicable, es posible hacer neumotórax intra-pleural comunicando o no ambos.

RESULTADOS

El autor se refiere a dos series de casos: casos operados hasta enero de 1942 y casos operados de febrero de 1942 a noviembre 20 del mismo año, sumando ambas estadísticas se obtienen 100 casos con los resultados siguientes:

Casos con esputo vuelto negativo	55
Casos con esputo positivo	26
Fallecidos	16

Hace notar que solamente una muerte es atribuible a la operación.

Los otros quince casos eran de muy avanzados en los que la operación se empleó como método auxiliar.

De hecho sostiene que cuando el neumotórax extra-pleural es practicado en casos con lesiones unilaterales relativamente recientes, la negativación es constante.

Entre los casos recientemente operados existen algunos cuyos esputos aun no son negativos pero que por sus circunstancias se espera lo sean pronto.

Termina diciendo que cada neumotórax extra-pleural satisfactorio referido, es un enfermo salvado de la toracoplastía, al que se dan los beneficios del colapso temporal.

Fibrosarcoma of the Tongue With Report of a Case*

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and J. M. DONALDSON, JR., M.D.**
San Antonio, Texas

Primary sarcoma of the tongue is a rare condition[1,4,8,16,18,23,24,27,29] while fibrosarcoma is one of the least common types of sarcoma observed in this location.[3,13,31] Baastrup[4] was able to find only four cases of fibrosarcoma among 58 cases of sarcoma of the tongue in his review of the literature in 1912. More recently the literature has been critically examined and many cases formerly considered primary are now considered to be secondary. Thus Betke[6] in 1915 reported only 42 cases which he considered to be primary.

In 1935 Cernezzi and Orlandi[12] were able to find 56 cases to which they added one. They further stated that in the vast material of the Milan Institute of Pathologic Anatomy and of the Cancer Institute no case of primary sarcoma of the tongue had been observed.

A. P. Stout[31] states that he has in his files but one doubtful case of fibrosarcoma, while Ewing[13] has not had a fibrosarcoma of the tongue in his extensive material. The Clinical Research Division of the National Cancer Institute[34] has had no case of fibrosarcoma of the tongue. Neither have the workers of the National Institute of Health of the U. S. Public Health Service[21] observed a case in over 2,000 tumor cases studied in the last ten years.

In 163 cases of fibrosarcoma reported by Warren and Sommer[33] only one case of fibrosarcoma of the tongue was found. Since Cernezzi and Orlandi[12] made their report we have been able to find three additional cases of primary sarcoma of the tongue which with our case make a total of 61 cases.

Mallory,[22] however, states that he has observed five cases of fibrosarcoma of the tongue in which there was no doubt as to the diagnosis.

Although sarcoma is usually thought to occur most commonly in the very young, Nathansan and Welch[26] found the average age in their group of 176 cases of fibrosarcoma to be 41 years for both males and females. Fibrosarcoma was also found by these authors to be more common in males (68.2%). Prata,[28] however, feels that most cases occur in patients under 30 years of age.

CASE REPORT

M. P. S., a white male, age 33, presented himself to his physician on January 23, 1941, stating that he had had influenza and that he

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**Texas State Tuberculosis Sanatorium, Sanatorium, Texas.

continued to have a productive cough and pain in the chest. Physical examination of his chest was negative at this time but an x-ray of the chest (Fig. 1) revealed a questionable infiltration in the right apex. He was advised to return in three weeks for another examination but he did not return until July of 1941. An x-ray of the chest (Fig. 2) revealed a progression of the lesion in the right apex. A diagnosis of pulmonary tuberculosis was made and one specimen of sputum was reported to contain tubercle bacilli.

On July 14, 1941, the patient had several teeth extracted. Three days later his tongue became blue and began to swell. He again consulted his physician who considered the lesion of the tongue to

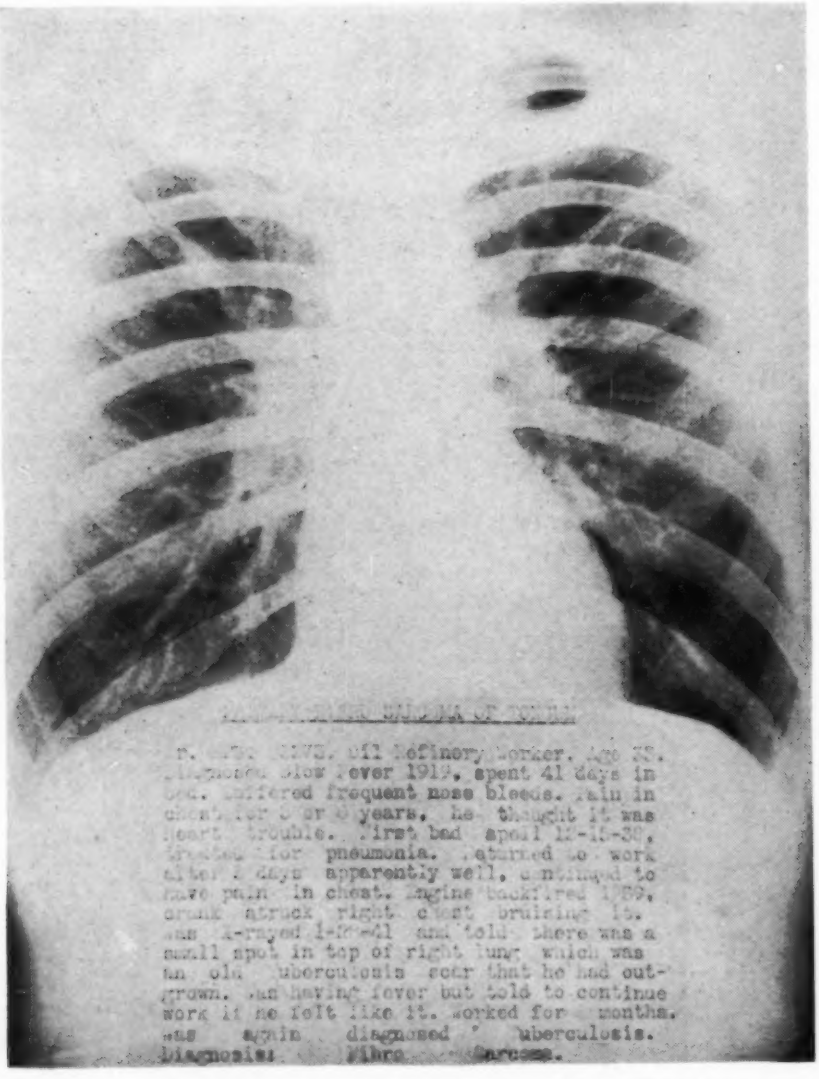

Fig. 1—X-ray examination of January 23, 1941, shows a scarring or peribronchial thickening in both apices, especially marked upon the right where there is a small scar at the anterior end of the first rib.

be a cold abscess although smears from the ulcerated surface were negative for tubercle bacilli. This "abscess" was lanced and he was advised to enter a tuberculosis sanatorium.

The patient entered Woodmen of the World War Memorial Hospital on August 11, 1941, and further questioning failed to reveal anything of significance in the past history other than that he was ill for 41 days in 1919 of a condition diagnosed as "slow fever;" he had pneumonia in 1938 and an injury of the chest in 1939.

Physical examination revealed an emaciated male weighing 119 pounds. The tongue presented a "lemon" sized tumor on the right side (Fig. 3). Much of the surface of the neoplasm was covered with

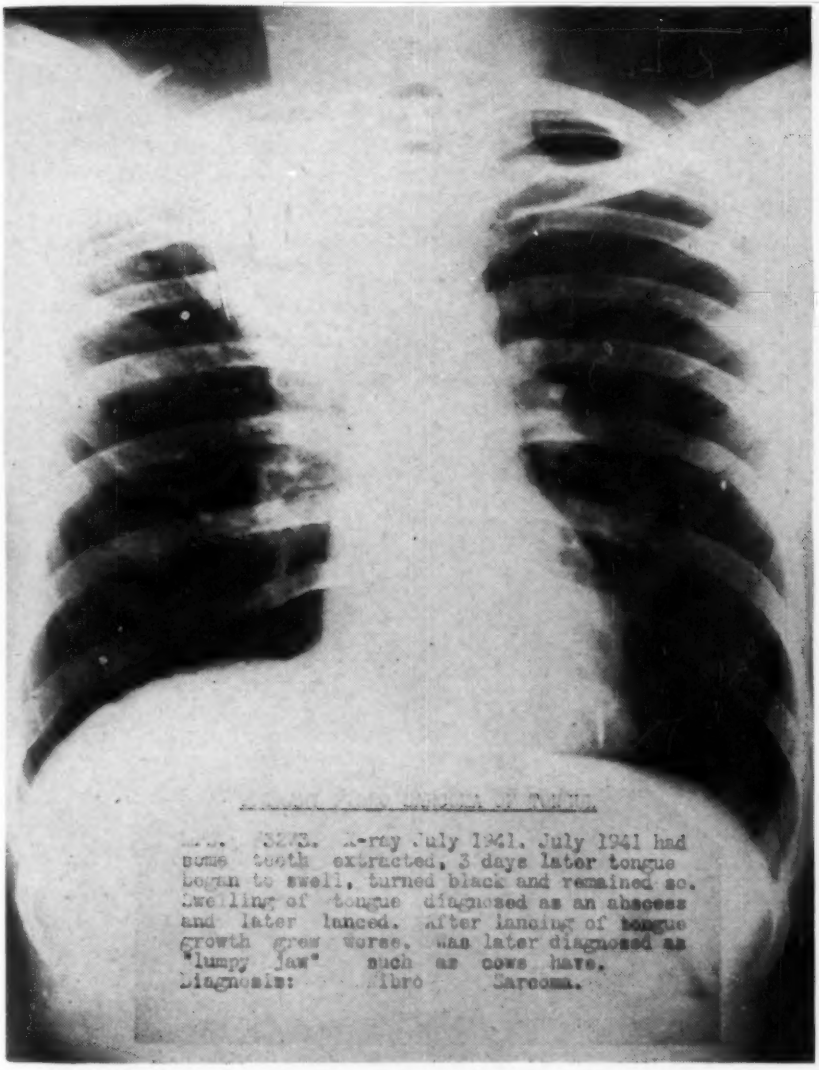
X-ray July 1941. July 1941 had
some tooth extracted, 3 days later tongue
began to swell, turned black and remained so.
Swelling of tongue diagnosed as an abscess
and later lanced. After lancing of tongue
growth grew worse, was later diagnosed as
"lumpy jaw" such as cows have.
Diagnosis: Fibro Sarcoma.

Fig. 2—The x-ray taken in July of 1941 shows an area of consolidation involving the entire right apex and the first interspace. This area is triangular in shape and extends downward to the third interspace anteriorly.

large cysts, many of which contained extravasations of blood. The surface was ulcerated and discharged foul, purulent material from a sinus. The remainder of the physical examination was negative.

The sputum was negative for tubercle bacilli; the sedimentation rate[19,25] was 50%, 63%, 68%; erythrocyte count 4,300,000; leukocyte count 18,000; polymorphonuclear leukocytes 79%; lymphocytes 14%; monocytes 7%; hemoglobin 78% (Dare); and the Kahn and Kolmer were negative. The urine had a specific gravity of 1.027; showed two plus albumin and two plus pus cells with occasional erythrocytes and granular casts.

No "sulphur granules" could be found upon direct examination of

Fig. 3—A "lemon" sized tumor was present upon the right side of the tongue and had the appearance of being cystic. Some of these cysts had a bluish color due to the extravasated blood.

the exudate from the sinus of the tongue nor were actinomyces found upon culturing this material. The exudate was also negative for tubercle bacilli.

The x-ray examination of August 12, 1941, (Fig. 4) was interpreted by Dr. Milton Davis as follows: "The right apex and infraclavicular region are opaque with a rounded lower border. One must consider a malignancy in this case. One must also consider the pathology in the apical region as primary with secondary deposits above the right and left diaphragms."

In attempting to arrive at a diagnosis, pulmonary tuberculosis

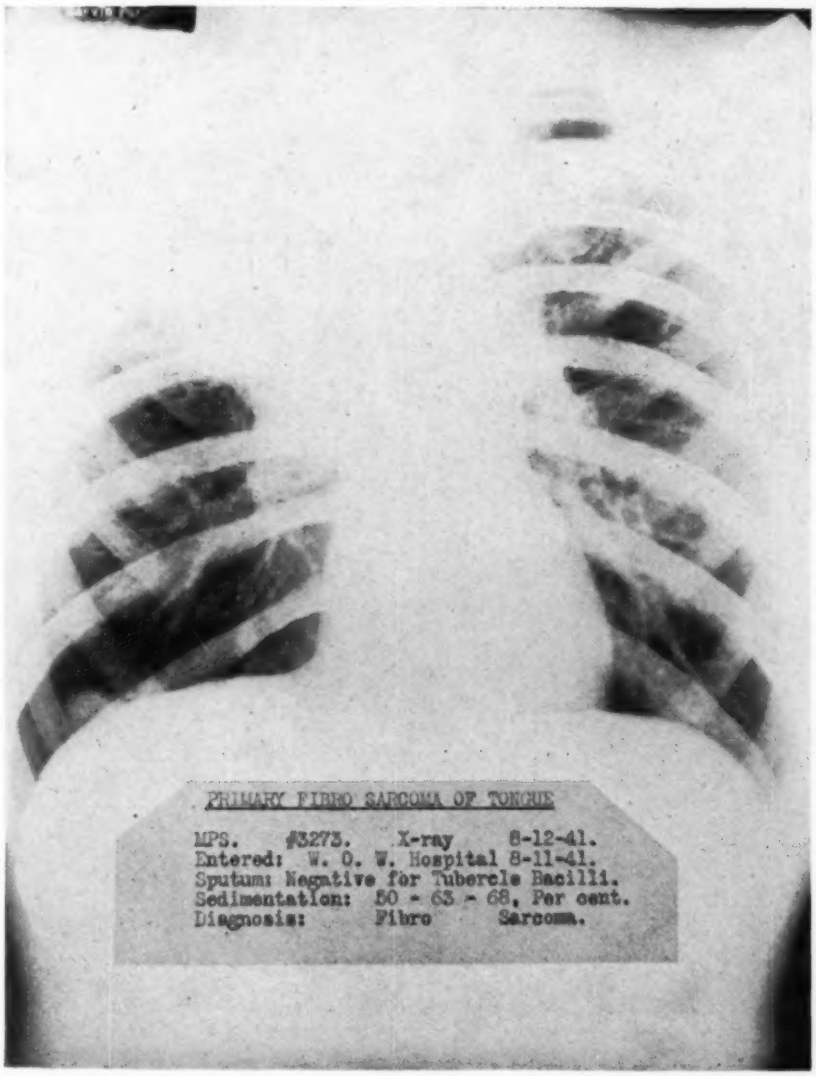
PRIMARY FIBRO SARCOMA OF TONGUE
MPS. #3273. X-ray 8-12-41.
Entered: W. O. W. Hospital 8-11-41.
Sputum: Negative for Tubercle Bacilli.
Sedimentation: 50 - 65 - 68, Per cent.
Diagnosis: Fibro Sarcoma.

Fig. 4—X-ray examination of August 12, 1941, shows that the consolidation has extended to involve practically the entire right upper lobe of the lung. In the lower lobe there is an area of increased density about two centimeters in diameter at the extreme base. These findings are due to a metastatic malignancy.

with tuberculosis of the tongue were considered as well as carcinoma and sarcoma of the tongue with metastasis to the lung. Actinomycosis was considered but ruled out. A tentative diagnosis of sarcoma of the tongue with metastasis to the lung was made, although the possibility that the lesion in the right lung might be tuberculosis and therefore unrelated to the tumor of the tongue seemed plausible since the pulmonary pathology was first to manifest itself. A biopsy was not considered advisable.

During the patient's stay in the hospital his temperature range was 99.4 to 102 degrees; the pulse range 92 to 142 and the respiration varied from 16 to 32. He complained constantly of pain in his throat

Fig. 5—Because the tumor was so large and painful, the tongue could not be protruded and it was only after death that the entire extent of the neoplasm could be observed.

and chest and at times became irrational. Necrotic portions of the tumor sloughed out and profuse bleeding occurred on several occasions. He died suddenly on August 18, 1941, after being in the hospital for one week.

Although permission for an autopsy was refused, one of us (Dr. C. J. Koerth) was permitted to remove the tongue for examination (Fig. 5).

The pathological report given by Dr. B. F. Stout and Dr. A. O. Severance was as follows:

Gross Description—The specimen consists of the tongue which has been removed close to its posterior attachment (Fig. 6). It measures 7 cm. in length, 5 cm. in width and 2 cm. in thickness. The buccal

Fig. 6—Attached to the tongue is a large greenish-gray mass measuring 8 cm. by 5 cm. by 2.5 cm.

surface shows a brown, thickened coat covering the papillae. Attached to the right side of the tongue is a large greenish-gray mass somewhat bulbar in shape, which measures 8 cm. by 5 cm. by 2.5 cm. It has the appearance of being necrotic. A single section was made through the center of the mass and including the tongue. The cut surface of the growth seems to be of a fibrous nature and is pinkish-gray in color and fuses with the normal tissue of the tongue. Around the periphery appear necrotic areas which are dark green in color and contain small cystic cavities. The largest of these is 2 cm. in diameter and is located in the posterior portion of the tongue. Other inter-communicating cavities are located throughout the tumor.

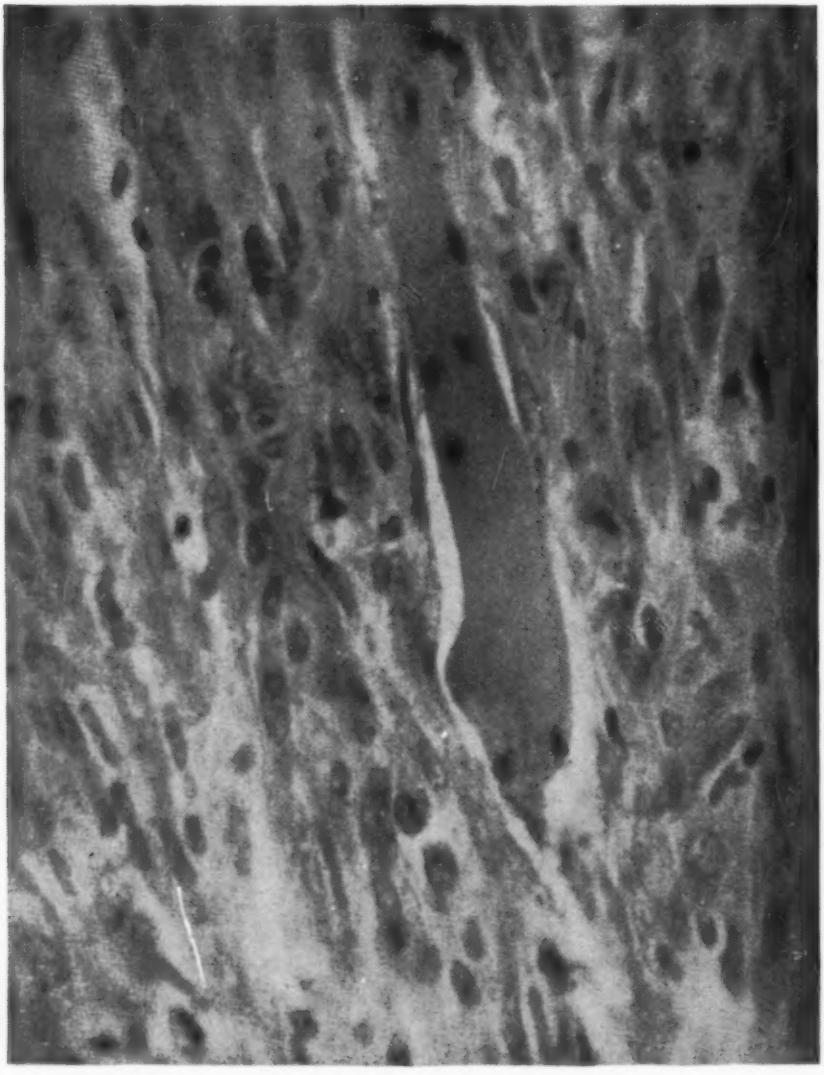

Fig. 7—Sections of the neoplasm showed it to be composed of spindle cells arranged in bundles and whorls with occasional multi-nucleated ribbon cells.

Under low power magnification the structure is fasciculated somewhat in the manner of a fibroma.

Microscopic Description—Section of the tumor mass from the tongue shows the tumor cells arranged in interlacing bundles and whorls. The individual cells vary greatly in size and shape while some large tumor giant cells are present (Fig. 7). Scattered about among the tumor cells are both degenerating and well preserved skeletal muscle cells. The cells, in general, are long spindle shaped ones with long vesicular nuclei. Some of the nuclei have pointed ends while others have blunt rounded ends. Mitotic figures average two per high power field. The cells are separated by a fairly large amount of wavy collagen fibers which are clearly brought out in

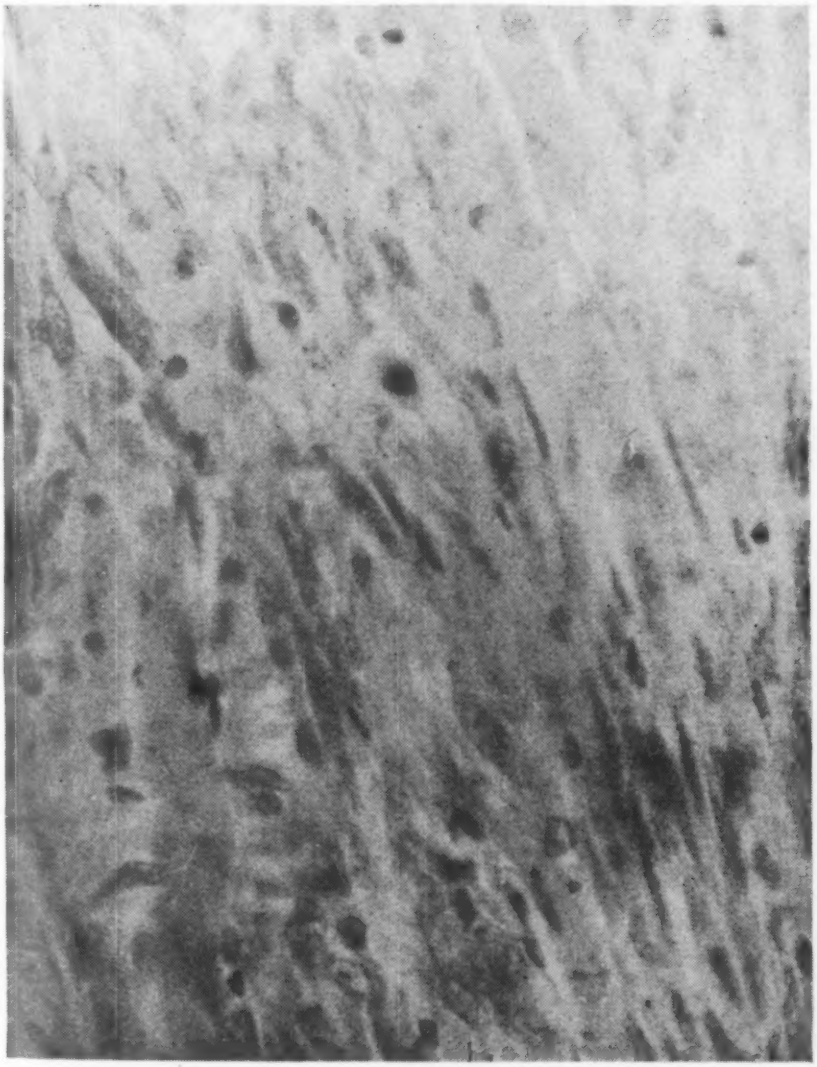

Fig. 8—The neoplastic cells are separated by an abundance of wavy collagen fibers which are well shown in this section stained with phosphotungstic acid.

both the Masson's trichrome stain and the phosphotungstic acid preparation (Fig. 8). The tumor possesses a nominal blood supply. The surface is covered in some areas by a thick stratified squamous epithelium while much of the surface is covered by a thick layer of necrotic debris. The latter rests upon the ulcerated surface of the tumor.

In the phosphotungstic acid and trichrome stains, the few skeletal muscle cells stand out in marked contrast to the majority of the cells because the latter stain differently and do not contain myofibrils or cross striations. The presence of the skeletal muscle cells must be explained as having been left behind as the tumor cells encroached upon the tongue. In view of the absence of the myofibrils, the abundance of intercellular collagen, the few large monster cells, the long pointed nuclei of the tumor cells, and the typical interlacing pattern of the cells, we believe we are justified in classifying this neoplasm as a fibrosarcoma. The lack of myxomatous areas further supports this view in spite of the rarity of fibrosarcoma of the tongue. We are convinced that the mass in the apex of the right lung represents a metastasis from the primary location in the tongue and not the reverse.

Diagnosis—Fibrosarcoma of the tongue.

This pathological specimen was examined by Dr. A. P. Stout and he concurred in the diagnosis of fibrosarcoma.

Following the classification of Broders[9] this tumor is a fibrogenic fibrosarcoma.

The etiology of fibrosarcoma is not definitely known though various theories have been advanced and different types of tumors of this class may arise from different sources. Some authors believe these neoplasms to arise from embryonic rests[2] while others believe they arise from fibrous or nerve tissue.[13]

Trauma[30] has been considered by some as an exciting factor in the etiology of sarcoma but this has not been well substantiated.

Sarcoma of the tongue usually presents grossly one of two forms; the interstitial and the sessile or pedunculated.[17,27] Baccarini[5] believes the prognosis to be more favorable in the pedunculated type. Sarcoma is most frequently seen in the middle and posterior thirds of the tongue but does occur in the anterior third.[29]

Fibrosarcomas are composed of cells resembling fusiform fibroblasts which are often arranged in bundles traversing different planes or they may present an intertwining arrangement. However, much variation in structure is observed in the different neoplasms. Although the tumor may have the appearance of being sharply demarcated by a fibrous capsule, the growth extends beyond this barrier into the healthy surrounding tissue.[9,15,27] Because of the invasive quality of the fibrosarcoma, blood vessels, muscle and nerves may become incorporated within it as was the case in our tumor.

The neoplasm is supported by a stroma of fibers radiating from small blood vessels and often in many areas the malignant cells line the blood channels. This arrangement explains the ease and frequency of blood stream dissemination.[9,15] Although metastasis to the lymph nodes[33] does occur, it is not frequent because of the scarcity of lymphatics within these tumors.

Broders[9] recognizes three distinct types of fibrosarcoma but acknewledges various transitional or intermediate types. Others attempt more or less complex classifications according to rate of growth[14] and histogenesis.[33]

The fibrogenic sarcoma is composed of fusiform cells separated by strands or bundles of collagen. The less malignant tumors have more or less uniform cellular composition and may resemble benign fibromas. These fusiform cells have oval nuclei. The cytoplasm is abundant and acidophilic. The more malignant tumors of this type are composed of cells with unusual growth capacities such that in the same neoplasm very small and very large cells are present. Large spindle cells with abundant acidophilic cytoplasm are present. Gigantic cells with lobulated and multiple nuclei are numerous. Many atypical mitoses are observed and the cytoplasm of some of the cells shows vacuolization. The smaller cells are spindle shaped with decreased cytoplasm and small hyperchromatic nuclei. Abundant collagen separates the cells in most of these tumors although it may be considerably reduced in the more malignant ones.

The cellular spindle cell type is composed of spindle cells that are more nearly uniform in size and are closely packed with little collagen separating the cells. These cells contain very little cytoplasm and the hyperchromatic nuclei are fusiform and may be blunt or have pointed ends. Giant cells are rare. Although less formidable appearing under the microscope than the generally more malignant fibrogenic sarcoma, many of these spindle cell sarcomas are of equal malignancy.

There is a great deal of difference of opinion as to whether myxosarcoma should be classified as a separate type or as a variant of fibrosarcoma.[9,33] The cells are spindle or star shaped with a homogeneous basophilic matrix separating the cells. In the more rapidly growing ones the intercellular matrix may be reduced in amount and the cells numerous. The nuclei may be fusiform, oval or lobulated. A few fibrogenic sarcomas have similar features. The amount of myxomatous material present in primary and recurrent fibrosarcomas may vary considerably.

Metastasis, a common occurrence in sarcoma, usually involves the lungs by way of the blood stream. Other organs, however, may be involved such as the liver, spleen and kidney.[10] Because of the vascularity of these malignancies and the intimate way in which the tumor cells often line the vascular channels, it is not difficult to

understand the frequency of blood stream dissemination. Although much less common, lymph node involvement does occur.[33]

Recurrences following removal of the sarcoma are usually due to incomplete removal if metastasis had not occurred prior to operation. If recurrence takes place, it usually occurs within a year. Recurrent tumors may be single or multiple. The prognosis is usually grave when recurrences occur. Broders[9] et al did not find the degree of the malignancy to increase with each recurrence as some investigators have observed. On the contrary, they found the structure of the recurrent tumor to be essentially the same as that of the preceding one. The exception to this was an increase in the amount of myxomatous tissue observed in some of the recurrent tumors.

The symptoms produced by sarcoma of the tongue are the sensations produced by swelling of the tongue. The onset may be insidious or rapid. Pain is said to be exceptional and occurs only when ulceration of the area takes place.[29] Speech and deglutition may be mechanically interfered with due to the size of the tumor.

The early diagnosis of sarcoma of the tongue is difficult and a biopsy may be necessary to determine the nature of the growth. To be excluded in the differential diagnosis are tuberculous ulcer, syphilitic gumma, actinomycosis, adenoma, retention and dermoid cysts, lipoma, fibroma and lingual goitre.[7]

In the treatment of fibrosarcoma complete removal of the neoplasm with a zone of healthy tissue is necessary to prevent recurrence. If simple enucleation, which is easily done because of the simulated capsule, is employed, recurrence is almost certain because of the invasive processes extending beyond the capsule.[27] Radiation therapy has been disappointing when used alone,[33] but may be applied after surgical intervention.

DISCUSSION

Since we were unable to examine the lungs of this patient it is impossible definitely to rule out the possibility of the concomitant presence of pulmonary tuberculosis and metastatic sarcoma of the lungs. We were not able to find tubercle bacilli in the sputum during the time the patient was under our observation although a specimen had been reported positive before he entered the hospital. Even though we do not believe tuberculosis was present it cannot be definitely excluded. Tuberculosis and malignancies of the lungs have been found to occur together occasionally.[20]

Although pulmonary symptoms first called attention to the presence of the tumor, we believe that the primary neoplasm was located in the tongue; an opinion in which Dr. A. P. Stout of the Columbia University Department of Surgery concurred. It is a common occurrence to observe neoplasms in which the metastases call attention to their presence while the primary tumor remains "silent."

The lungs are the most common site to which sarcomas metastasize. The multiple rounded opaque areas observed in the x-ray pictures were very suggestive of a metastatic process. Retrograde metastasis from the lungs to the tongue would be difficult to explain and does not seem at all plausible. The idea that multiple fibrosarcomas may arise simultaneously from nodules of fibrous tissue in Von Recklinghausen's Disease has been suggested to explain cases in which widely separated sarcomas could not be explained upon a basis of metastasis.

Whether trauma to the tongue occurring upon extraction of the patient's teeth acted as an exciting factor in this fibrosarcoma is difficult to say. However, since the pulmonary process, which we believe to be a metastasis, had been observed previous to this incident this seems unlikely.

The authors wish to express their appreciation to Doctors E. F. Lyon, R. G. Giles, and Milton Davis for their aid in studying the x-ray films of this patient; and to Doctors A. P. Stout, B. F. Stout and A. O. Severance for their careful study of the pathological material.

SUMMARY

The authors present a review of the literature on sarcoma of the tongue, which is a rare occurrence, and present one case report. This was an intensely interesting case of fibrosarcoma of the tongue followed to exitus. A complete pathological description of the tumor is given as well as a summary of pathological descriptions compiled from reports of other authors. The case is illustrated with x-rays, pictures of the actual tumor and microscopic sections.

RESUMEN

Los autores presentan un repaso completo de la literatura referente al sarcoma de la lengua, cuya ocurrencia es bastante rara, y presentan un informe relativo a un caso. Este fue un caso sumamente interesante de fibrosarcoma de la lengua que se observó continuamente hasta la muerte del enfermo. Dáse una completa descripción patológica del tumor así como un resumen de las descripciones patológicas compiladas de los informes presentados por otros autores. El caso está completamente ilustrado con radiografías, fotografías del tumor mismo y secciones microscópicas.

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Discussion

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San Antonio, Texas

The paper just presented by Dr. McCorkle represents a most valuable addition to the literature of neoplasms of the tongue. The authors have made an exhaustive review of the literature searching for reports or discussions of a similar tumor, and they have brought their subject up to date. It is an excellent piece of worked combined with a most interesting case report.

As has been pointed out, sarcomas of the tongue are rare indeed. Of the three types of sarcomas conceivable in this location, namely, rhabdomyosarcoma, fibrosarcoma, and lymphosarcoma, the first type is the most frequent. Ewing reports four cases of lymphosarcoma found in the literature, some cases of rhabdomyosarcoma, but no case of fibrosarcoma among the tongue neoplasms. Of the mesodernal types of neoplasms of the tongue, the rhabdomyomas are the most frequent, and the malignant counterpart of these skeletal muscle tumors are in proportion infrequent.

The reports in the literature on sarcomas of the tongue are somewhat confusing because of use of descriptive terms now out of date, such as "round cell sarcoma" and because of failure of pathologists to employ proper stains to differentiate the rhabdomyosarcomas from the malignant melanomas, lymphosarcomas, and fibrosarcomas. The confusion between malignant melanomas and lymphosarcomas in the past has also led to the use of the term "round cell sarcoma." While fibrosarcoma of the tongue is admittedly very rare, it is possible that special stains such as Masson's trichrome or the phosphotungstic acid stain will in the future make this tumor of the tongue even more rare. A. I. Rakow wrote an article in *The American Journal of Cancer,* 30: 455, 1937, which will aid in clarifying this problem for the pathologist.

In the past the accurate classification of these sarcomas into their various types has been of academic interest to the pathologist. However, the selection of proper means of therapy, the type of surgical procedure, the extent and type of radiation, if any, the probability of recurrence or metastasis, and the ultimate prognosis can be determined or influenced largely by a careful pathologic study of the tumor or a biopsy from it. This fact then becomes one of vital interest to the clinician.

Giant Mediastinal Hernia in the Course of Bilateral Pneumothorax*

R. SANCHEZ ACOSTA, M.D., *and* P. DIAZ JUAN, M.D.
Havana, Cuba

Mediastinal hernia is a common occurrence in the course of artificial pneumothorax. Being for the most part innocuous, little thought is given it and there is wide divergence of opinion in estimating its actual frequency.

Some authors, Eber among them, considered herniation of the mediastinum a constant feature in pneumothorax. This view had to be reconsidered after hypotensive pneumothorax, introduced by Ascoli, became generally used. In the majority of cases mediastinal hernia is a radiological finding only, and its presence does not influence the conduct of therapy.

The following case presents some novel and interesting features, and is another example of perfect tolerance in this condition, even when herniation had attained a giant size.

Case No. 4097—M. A. G., a 26-year-old, female, white cuban, was admitted to the Sanatorium in July, 1938, with ulcerative lesions of the left upper lobe and positive sputum.

Left pneumothorax proved ineffective because of adhesions, necessitating intrapleural pneumonolysis. Subsequent involvement of the right lung also required its collapse by pneumothorax.

Soon after institution of pneumothorax on the right side, a left mediastinal hernia was observed. This herniation became more prominent when insufflation of the left side was delayed.

Inasmuch as the right side was kept between −8 and −16 inspiratory pressure, with refills of about 200 cc. of air at fifteen-day intervals, the hernia was regarded as caused by aspiration of the mediastinum into the left hemithorax.

At the time we took charge of the case, finding a positive sputum with the right lung apparently clear, we were inclined to attribute the sputum findings to the more thoroughly collapsed left lung. Partial re-expansion of this lung was decided upon in order to ascertain its radiological aspect. In trying to do so, we observed an increase in the size of the hernial pouch. It ballooned out into the left hemithorax until it came in contact with the chest wall, taking the position and appearance of the left upper lobe.

In order to re-collapse the left lung, air was injected into the corresponding hemithorax at the axillary level but only a further

*Staff of "La Esperanza Sanatorium," Havana, Cuba.

collapse of the right lung was obtained. This same effect followed injection of air at other levels in the left side, including the infraclavicular region. In further attempts we were able to avoid the massive mediastinal hernia and obtain the total collapse of the left lung, with disappearance of the hernia.

At one time, 700 cc. of air was injected into the left side, resulting in a marked collapse of the right lung. This was done to ascertain beyond doubt that air actually passed into the right pleural sac. At no time did the patient show any untoward symptoms, tolerance being apparently perfect.

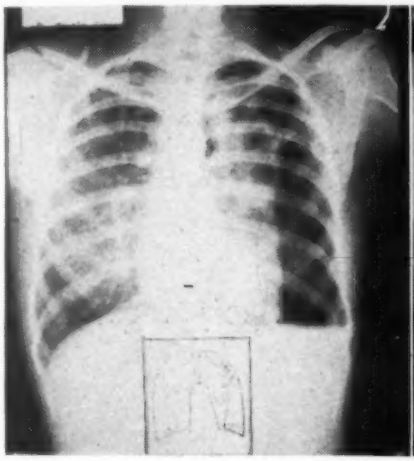

Figure 1

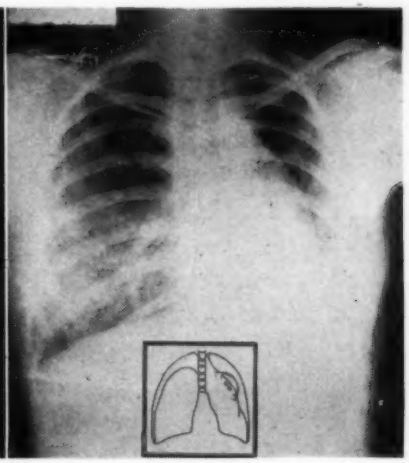

Figure 2

Fig. 1—Left pneumothorax; cavitation, small pleural effusion and pleuropulmonary adhesions.

Fig. 2—Mediastinal herniation into left hemithorax.

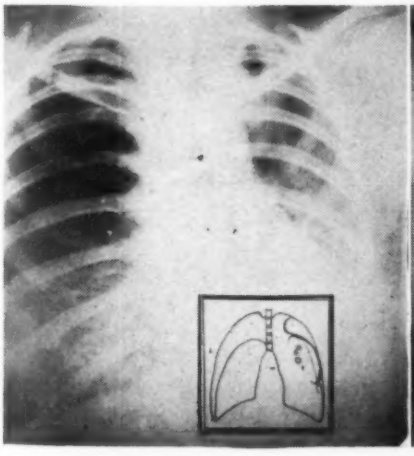

Figure 3

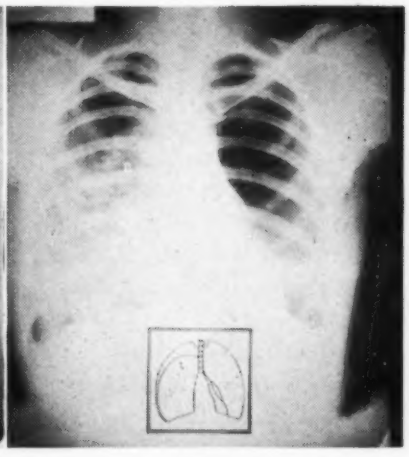

Figure 4

Fig. 3—Hernial pouch in contact with left chest wall. Right pneumothorax increased by attempted introduction of air into left hemithorax.

Fig. 4—Herniation no longer demonstrable. Complete collapse recovered in left side.

We avoided the use of lipiodol intrapleurally as a diagnostic procedure in this case for fear of causing pleural irritation and consequent fixing of the organs in their anomalous position.

SUMMARY

A case is reported of giant mediastinal hernia, caused by aspiration of the mediastinum into left hemithorax. This condition was apparently induced by lack of re-expansion of the left lung in a patient with bilateral pneumothorax.

The hernial pouch came in contact with the left thoracic wall, simulating in appearance a pulmonary lobe.

In attempting to insufflate the left pleural sac, the hernial pouch was punctured and air passed into the right pleura as evidenced by an increased collapse of the corresponding lung. This enormous mediastinal hernia did not give rise to any untoward symptoms.

Successful introduction of air into the left pleural sac caused the hernia to disappear, and complete collapse of the left lung was obtained.

RESUMEN

Se presenta un informe relativo a un caso de hernia mediastinal gigantesca, que resultó cuando el mediastino fue aspirado hacia el hemitórax izquierdo. Esta situación fue aparentemente causada por falta de reexpansión del pulmón izquierdo en un enfermo que recibía neumotórax bilateral.

El saco herniario llegó a estar en contacto con la pared torácica izquierda, dando la apariencia de ser un lóbulo pulmonar.

Cuando tratóse de introducir aire en la cavidad pleural izquierda se agujereó el saco herniario y el aire se pasó de la cavidad pleural derecha, lo que se manifestó en el aumento del aplastamiento del correspondiente pulmón. Esta enorme hernia mediastinal no causó ningún síntoma desagradable.

La introducción satisfactoria de aire en la cavidad pleural izquierda causó la desaparición de la hernia y el aplastamiento completo del pulmón izquierdo.

Report of Council on Pan-American Affairs

American College of Chest Physicians

During the time that has elapsed since the Annual Meeting in Atlantic City, good progress has been made in developing the activities of the College in the various countries of Latin America. This is a brief report of the present status of the College in Mexico, in Central America, in the West Indies, and in South America.

Mexico now has a group of very active Fellows and Associate Members under the leadership of Dr. Donato Alarcon, Regent, one of the ablest phthisiologists and thoracic surgeons of the Americas.

Central America has not yet many members, but a Governor has recently been appointed for Panama, Dr. Vicente Mastellari. It is to be hoped that before long, enough additional members will be elected from that country to form a chapter, which would be the first in Central America. Dr. Vicente Mastellari is chief of the Department of Tuberculosis at the Santo Tomas Hospital in Panama City. Steps are being taken toward the obtaining of additional members in Guatemala, Honduras, El Salvador, Costa Rica and Nicaragua.

The West Indies are represented by the increasingly active Cuban Chapter, which has been doing exceptionally fine work under the energetic leadership of Dr. Antonio Navarrete, Regent for Cuba, and Dr. Octavio Rivero, Governor.

The West Indies are also now represented by the newly organized Puerto Rico Chapter, which has been formed under the guidance of Dr. Rodriguez Pastor. Dr. Rodriguez Pastor is now Regent of the College for Puerto Rico.

The situation in Haiti and the Dominican Republic is being investigated, as is also the situation in Jamaica, Trinidad and the Bahamas, but the College does not yet have many members in those countries.

South America has recently acquired its first chapter in Brazil. Dr. Affonso MacDowell, of Rio de Janeiro, is Regent for Brazil and deserves the credit for the organization of this chapter, which took place November 13th, 1942, with 5 Fellows and 19 Associate Members, representing all of the principal cities of Brazil.

Argentina, Colombia, Ecuador, Peru and Uruguay now have Regents or Governors, or both, and these leaders are gradually accumulating a sufficient number of qualified Fellows and Associate Members to form chapters in their respective countries.

In Chile, several leading chest physicians have been approached with regard to the work of the College, and it is hoped that before long officers will be appointed there and that the nucleus of a Chilean Chapter may be established. The College does not yet have any members in Bolivia, Paraguay and Venezuela, but it is planned to communicate with the chest physicians of these countries in the very near future in order to discover whether or not they would be interested in joining.

Besides promoting the increase in membership in the Latin American countries, and the establishment of new chapters, the Council on Pan-American Affairs has encouraged the submission of papers by the Latin American members for publication in *Diseases of the Chest*. Furthermore, the Council wishes to call attention to the fact that all scientific articles published in the Journal are now followed by abstracts in Spanish. This policy was recommended by the Council after it had been suggested at our meeting in Atlantic City by Dr. Navarrete and Dr. Alarcon.

The Council on Pan-American Affairs will gladly help post graduate students from any of the Latin American countries get located in sanatoria or hospitals in the United States, or help any physicians or surgeons in the United States make arrangements for post graduate study in any of the other countries of the Western Hemisphere.

Council on Pan-American Affairs
Chevalier L. Jackson, *Chairman*

Symposium on Tuberculosis in the Pan-American Countries

Introduction

At the Eighth Annual Banquet of the American College of Chest Physicians held at the Hotel Dennis, Atlantic City, New Jersey, June 7, 1942, the following reports were given by invited guests from Argentina, Mexico and Cuba, on the present status of tuberculosis in their respective countries.

These reports were well received and it is the intention of the Editorial Board of *Diseases of the Chest* to publish similar reports from other countries in the future issues of the journal.

The speakers were introduced by Dr. George G. Ornstein, New York City, First Vice-President of the College, Toastmaster for the evening. Earlier in the day, the guest speakers and other visiting physicians from the Pan-American countries attended a luncheon given by Dr. Chevalier L. Jackson, Philadelphia, Chairman of the Council on Pan-American Affairs of the American College of Chest Physicians.

The Fellows of the College hope that these good friends will visit our country often. The warm friendship that is being established among the Fellows of the College throughout the world will do much to help solve some of our more difficult post-war problems.

R. C. M.

Tuberculosis in the Argentine

ALVARO E. BENCE, M.D.
Buenos Aires, Argentina

Mr. Chairman, Fellow Doctors, Gentlemen:

For reasons beyond their control, it was not possible for either one of the two men most capable and authorized in Argentina to speak to you about the conditions in that country with respect to tuberculosis. I refer to Professors Raul F. Vaccarezza of Buenos Aires, Governor of the American College of Chest Physicians, and Gumersindo Sayago of Cordoba, Regent of the College in Argentina. I shall try to discharge this difficult assignment and give you in this short time an idea of the control of tuberculosis in the Argentine; and I hope it will be worthy of the importance of the outstanding specialists gathered here tonight.

Argentina, a Latin-American country, located at the southern-

most part of the continent, has a very homogeneous population, consisting in the greater part of people of European ancestry. For this reason our indexes of mortality and morbidity are uniform, without race peculiarity of any kind.

The Argentine Republic, with a population of over thirteen million inhabitants, appears in the international medical picture among the countries with tuberculosis death rates of medium volume. The yearly index of deaths due to tuberculosis averages about 12 per 10,000 inhabitants. Some provinces in the northern part of Argentina (Jujuy and Salta) are still in that phase called massive or epidemic; the rest of the population is now living in the phase known as endemic or slow involution. Like most civilized countries, Argentina has shown during the past 20 years a gradual decrease in the percentage of deaths due to tuberculosis. From 1914 to 1936, the death rate was reduced from 17.6 to 12 per 10,000 inhabitants. This is a very important reduction, equivalent to 27.8 per cent; however, this is smaller than that obtained during the same period of time in other countries like the United States, with a decrease of 61 per cent in the death rate due to tuberculosis in the last 20 years.[1] From 1914 to 1936, the population of the Argentine Republic increased by 59.3 per cent, while the general death rate increase was only 25.2 per cent, and the increase in the death rate from tuberculosis was 15.1 per cent.[2]

In the city of Buenos Aires, with a population of over two and one-half million inhabitants, the death rate from tuberculosis has been reduced from 210 per 100,000 inhabitants in 1924, to 128 per 100,000 in 1936. This decrease is more prominent in the women than in the men, but it has affected both sexes and is more noticeable in the male population by the deviation towards the right of the so-called Gummings curve (death curve by age groups). In Buenos Aires, as in New York, the tuberculosis death curve shows a change for both sexes; faster but shorter in the women, the peak being between the ages of 20 and 24; and a slower, more even rise in the men, the peak being between the ages of 50 and 59. This change is not noticeable in the tuberculosis death rate of the rest of the country. The coefficient of tuberculosis morbidity-mortality recently established is 3.2 to which we must add the several forms of non-apparent tuberculosis amounting to 15 per 1000 people supposed to be sound (Vaccarezza and associates). The tuberculization index for 1940 given out by the Army Medical Corps for draftees 20 years old varies with the different provinces from 45.6 per cent to 99.7 per

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1 Dublin, L. I.: "Decline of Tuberculosis; Present Death Rates and Outlook for Future," *Am. Rev. of Tuberc.*, 43: 224, 1941.

2 Vaccarezza, R. F.; Paso, J. R., and Fink, I: "Perdida economica anual causada por la tuberculosis a la Argentina," *An. Cated de pat y clin. tuberc*, 3: 125 (June) 1941.

cent; for the capital city of Buenos Aires the index was 82.2 per cent.

In the service of Pathology and Clinic of Tuberculosis of the University of Buenos Aires, it has been compulsory since 1939 that tuberculin tests and radiological examinations are made of the students of Medicine, Economics, Agriculture and Veterinary Medicine. Such examinations are repeated at least once a year during the years of their enrollment. More than 8000 students have been examined so far. The general tuberculization index for the University students is 75.7 per cent, and the partial index is 65.6 per cent for those 16 years old, to 100 per cent for those over 24 years of age.

The anti-tuberculosis organization that started at the beginning of the century has been greatly increased in the last few years; however, it is still insufficient compared to the requirements of the number of cases to be cared for in the cities and throughout the country. The number of beds for tuberculous patients in hospitals and sanatoriums is quite below the number of yearly deaths, and at the present time a great deal is being done to promote and carry out the construction of new establishments to eliminate this deficiency. The organization of the anti-tuberculosis program has received, in our country, just criticism due to the lack of a central directing unit. This is because the different establishments—hospitals, sanatoriums, dispensaries, preventive locals, etc.—belong to the different government departments such as the Department of National Hygiene, Public Assistance, Welfare Society, University of Buenos Aires, Advisory Committee for Asylums and Hospitals (national, provincial or county); also private institutions, some semi-official, some free from official supervision, with all the inconveniences of multiple directorates and non-coordination among them. The situation jeopardizes the efficient organization of the program and increases the expense, but this is going to be eliminated by a law creating the National Tuberculosis Commission, appointed towards the end of 1941, for the purpose of centralizing the whole anti-tuberculosis program, incorporating the national establishments with the provincial, municipal and private establishments in order to adopt common methods, to coordinate and unite the work. It has also been proposed to increase the number of beds for the care of tuberculous patients and to inaugurate free clinics throughout the country, to have systematic examination of those local groups of persons supposed to be sound, and other initiatives in order to obtain even better results than so far obtained against the spread of this disease.

I wish to avail myself of this opportunity to express my thanks to the members of the American College of Chest Physicians and to their President for the many courtesies extended to me. I also wish to thank Dr. Chevalier L. Jackson, Chairman of the Council on Pan-American Affairs of the College, for the valuable instruction given to me during my stay in your country.

Tuberculosis in Mexico

DONATO G. ALARCON, M.D.
Mexico City, D. F.

Mr. Chairman, Fellows of the American College of Chest Physicians, Ladies and Gentlemen:

When I left my country, dark clouds were announcing the most dreadful storm ever to disturb the beautiful sky of Mexico. We, as many others, have had to enter the war and to face tremendous sufferings, toil and death. Circumstances compel us to join the democracies in this struggle for liberty, no matter how far we are going to be decimated by this worst of scourges.

If there are two activities opposed in the most diametrical sense, these are the martial task of destruction and the patient, persistent, decided work of our associations against tuberculosis. Medicine is the antithesis of everything tending to destroy life. But Medicine has to join the armies, has to follow the path of soldiers, vigilant for their health, alert for saving their life when armaments leave the slightest possibility for escape of a victim, and mitigating the tremendous sufferings of those whose destiny is not to survive.

I was invited to present before you a brief exposition of the situation of tuberculosis in Mexico; but I have to begin, stating that whatever the situation of tuberculosis in my country was a few days ago, a sudden change has occurred. Particularly is this true as regards the immediate future of the campaign against the disease and the results of our effort to date. As a consequence of the advent of war, we have only to expect increased mortality, higher morbidity, and we are prepared to see some of our hopes frustrated.

Our mortality today is estimated at 25,000 deaths a year for 20,000,000 population. The rate is therefore 125 per 100,000. Morbidity should be calculated at 250,000 for all forms. Our registered mortality is certainly under these numbers, as only 12,000 or 13,000 are recorded in the last years. Taking these last numbers to be conservative, we need at least 12,000 beds for the care of the tuberculous. And we have under 1000 available. In the last two years a tremendous effort was made by the governmental agencies to triple the number of beds; and definite plans for a campaign were started when I was formerly the director of the tuberculosis campaign in Mexico. Three new hospitals are under construction and a new pavilion is almost ready for occupancy at our sanatorium. A compulsory insurance plan was under study until recently to provide a regular source of funds for effective care of the thousands who are in need.

Work against tuberculosis in Mexico has some peculiarities worthwhile stressing. The activities are mostly in charge of the govern-

mental agencies and it is only recently that private initiative has contributed effort and money; but the government, nevertheless, is leading the campaign.

Our therapeutic problem is that of the poorer people. We are forced to use the most effective means to obtain prompt relief of the disease, in order to shorten the stay of patients in our hospitals. One bed for us is more valuable than it is for other communities, as these beds are very scarce. Surgery has to be used more frequently on account of the stage at which the patients come to the sanatoria.

That is the reason for the intensive work developed in our sanatorium at Huipulco, where the surgical activity is considerably greater than that of the majority of the leading hospitals for tuberculosis in the United States.

This attitude is justified by the following statements: In our sanatorium, sixty-eight per cent of the cases admitted are bilateral. Fifty per cent come with cavities visible on the roentgen film. About twelve per cent have bilateral cavities. Only five per cent come with moderately-sized infiltrates in the pneumonic stage.

Work in the institutions of Mexico is comparable by its results with that of the best institutions. Our effort is rewarded every day by the success obtained from the modern means of therapy. In certain techniques our group counts among the leading in the world.

To fight tuberculosis in an ample sense is not only to stop the episode of clinical disease; it is to prevent relapse, to avoid new cases, to limit danger of spreading and this task cannot be accomplished by institutions or organizations dealing solely with tuberculosis. Improvement of living conditions, hygienic education, better food, better housing, and money wisely spent are the resources which may bring eradication of tuberculosis amongst our people. This should be the result of progress of the community.

Therefore, whatever our effort be to force the steps of eradication, these only parallel the natural pace of the progressing community. We are still living in the hope that some new discoveries will help this task. We are perfecting our procedures to save lives, one by one, but the educational situation and the economic possibilities of our communities will influence the statistics of tuberculosis mortality for many years more.

Now let us contemplate the immediate future, during the war and after the war. War always has collected a tithe in tuberculosis victims. War is going to increase our mortality even for many years after its conclusion. It is our patriotic duty to fight against tuberculosis both during and after the war; and it is also our duty not to become discouraged by anything no matter how dark the picture looks. Better distribution of wealth and better distribution of health are the promising possibilities of the future, when peace will reign over the earth. Meanwhile, we have to strive and to fight earnestly

within our fields of endeavor to deserve the advent of peace, liberty and well being.

American colleagues have been fighting the same foes, disease and poverty; and now we have joined our efforts to yours to fight for liberty—which means everything for all people born under the glorious sky of the Americas.

Present Tuberculosis Status in Cuba

ANTONIO NAVARRETE, M.D.
Havana, Cuba

Mr. Chairman, Fellows of the College, Ladies and Gentlemen:

I have been invited by our President to bring to this meeting a report on the present status of tuberculosis in Cuba. I gladly comply with this request, as I consider the opportunity of addressing you a privilege despite the inconveniences of wartime international traveling.

Although the fight against tuberculosis has not reached, among us, the advanced stage found in most parts of the United States, a determined effort is being made to organize a systemaitc and efficient campaign against this scourge.

Before going into the details of the present tuberculosis status in Cuba it seems pertinent to recall a few facts about the country.

Cuba is a tropical, insular republic with an area of 44,000 square miles. Its economy is agricultural and its population is over four and one-half millions. Of its population 73 per cent are whites and 27 per cent colored.

Havana, the capital city, is the largest urban center, with close to 700,000 people.

The death rate from tuberculosis, although showing a steady downward trend, still amounts in Havana, according to reliable statistics, to 160 per 100,000. Less reliable reports place this death rate at about 65 per 100,000 for the country as a whole. Two main factors explain this remarkable difference: concentration in Havana of practically all hospital facilities for tuberculosis on one hand, less reliable estimates and more occultation in rural areas on the other.

Morbidity is placed at between 1.6 and 2.7 per cent, according to different sources.

No comprehensive survey to determine the rate of infection of the general population has been carried out as yet. The only one available, to which I will refer later more in detail, covers a limited, but representative, section of the city of Havana, with a population of 150,000. Reports from this survey place the rate of infection of the many thousands of persons examined, as judged by reaction to tuberculin, at 69.62 per cent.

Fragmentary reports from other sources would tend to show a slightly higher incidence of positive reactors among rural or semi-rural groups.

Factors That Influence the Incidence of Tuberculosis

As is the case elsewhere, the factors that influence the incidence of tuberculosis in Cuba are many and complex. I will dwell briefly on some of them.

Race—Our experience in Cuba is that the colored people present the same type of reinfection tuberculosis as the white, although exudative and caseo-pneumonic lesions seem to be more prevalent among the colored.

The limited data available on the rate of infection do not show a marked difference among races.

Colored people in Cuba live under much the same economical and social conditions as a considerable section of the white population. There is in Cuba little race segregation. All this tends to equalize the infection rates. Much epidemiological and social data must yet be gathered before a definite opinion can be advanced on this point.

Industrialization—Industrial hazards of the type that predispose to tuberculosis exist in Cuba. I have reported well-authenticated cases of silicosis observed at our sanatorium, but these factors do not seem to be of much practical importance because of limited industrial development. Large scale mining operations that have been undertaken recently may result in increased hazards and eventually alter the present situation. Prevalence of tuberculosis among tobacco workers should be ascribed to the unfavorable working conditions existing in the old plants, rather than to any deleterious effect of tobacco dust.

Malnutrition and Bad Living Conditions—More important are malnutrition and unhygienic dwellings. A considerable proportion of the population suffers from malnutrition because of insufficient means or simply because of deficient eating habits. I do not need to emphasize the importance of this fact in lowering resistance to tuberculosis.

Unhygienic dwellings play also an important role. A peculiar problem is presented by the crowded tenement houses in which many families live practically as one, in rooms centering around a common yard. Occasions for contamination in the presence of an open case of tuberculosis are obviously much increased by this proximity. These tenements abound in large urban centers. As many as 1,500 are said to exist within the district of one dispensary at Havana.

The facts just mentioned suffice to mark tuberculosis as one of the first and more urgent sanitary and social problems in Cuba, the

cause of much death, suffering and deteriorization, as well as great economic loss.

Efforts to cope with this problem date from the foundation of the Cuban Republic. The first Tuberculosis Dispensary was opened at Havana soon after the Spanish-American War by Major Furbush, of the American Army Medical Corps, with the cooperation of a group of Cuban physicians who had previously formed the League Against Tuberculosis. This institution still plays a leading role in the fight against the disease; and bears today the name of Major Furbush, a fit memorial to his humanitarian accomplishments. An American nurse, Miss Mary O'Donnell, was also active in starting the campaign against tuberculosis in Cuba. To the memory of both of them, as well as to Dr. Jacobsen and other Cuban medical pioneers in this field, I pay here my respects.

Successive Cuban governments continued the campaign with more or less vigor. In 1912, the first Sanatorium, "La Esperanza," was opened near Havana, with an initial capacity of 100 beds.

Some years later this Sanatorium was enlarged, new Dispensaries opened and a popular educational drive started.

In 1928 the University of Havana made a far-reaching contribution by the inauguration of its Chair of Tuberculosis.

But a sustained systematic anti-tuberculosis campaign on a national scale dates from the creation in 1936 of the National Council of Tuberculosis, a governmental agency for the control of this disease.

Shortly thereafter the city of Havana had five modern thoroughly equipped Dispensaries and each of the five provincial capitals was provided with a similar one. "La Esperanza" was enlarged to accommodate very nearly a thousand patients and more beds were set apart in other hospitals for tuberculous casas. At the same time, case-finding and case-control were modernized and a new impetus given to the whole campaign.

I will attempt to summarize this campaign as carried out, up to the present time, by the Director, Dr. D. E. Despaigne, and his collaborators of the National Council of Tuberculosis.

Case-Finding—Case-finding is done by the usual procedures, including examination of contacts, through the ten existing Dispensaries. An average of 4,000 new cases have been reported yearly for the last five years.

An interesting and valuable feature of the case-finding program has been the survey carried out by Dr. Mencía, of the National Council of Tuberculosis of Cuba and Drs. Mayer and Kahn, of the Cornell University Medical School. This survey covered a district of the city of Havana, with a population of 150,000, representative of the lower and middle classes. The work was started in 1937 and up

to May 1938, a total of 27,000 tuberculin tests with PPD were completed and over 10,000 radiographs were taken.

The percentage of positive reactors found was 69.62. Among those subjects having reached the second decade in life 91 per cent reacted positively. Whites, mulattoes and negroes did not show a marked difference as regards the percentages of positive reactors. Detailed reports of this survey have been published by the authors.

Although the importance of this work was generally recognized, financial and other difficulties prompted its discontinuation. Acquisition of roentgenphotographic equipment of the type devised by Dr. Manoel Abreu and so successfully used in Brazil and other Latin-American countries, will permit its resumption.

Case-Control—Control of cases is at present basically handicapped by the scarcity of available tuberculosis beds. This situation will become alleviated when the new institutions under construction are completed. They comprise a large climatic Sanatorium high in the hills of central Cuba, another in Oriente, the largest and most populated of our provinces, and a Hospital for children near Havana. This construction program which is nearing culmination will double the available bed capacity. The general plan calls eventually for a Sanatorium in each of the six provinces of the country.

In the meantime an effort is being made to control as far as is feasible the infective cases by home supervision and by pushing to the limit of its possibilities ambulatory treatment, particularly ambulatory collapse therapy, of which our Fellow, Dr. Octavio Rivero has been one of the pioneers at the Havana Municipal Sanatorium.

An outstanding example of the increasing diagnostic and treatment facilities in the Dispensaries is the Chevalier Jackson Bronchoscopic Department inaugurated recently, with the attendance of our friend, Dr. Chevalier L. Jackson, at the Laennec Dispensary in Havana, of which Dr. F. J. Menéndez, the Secretary-Treasurer of the Cuban Chapter of the College, is Director. This department, intended for diagnosis and treatment of tracheobronchial tuberculosis, is the first of its kind in our dispensarial system. It is in charge of Dr. P. Hernández, also one of our own men.

Education—The promotion of a successful tuberculosis campaign requires much educational work: education of the public in the elementary facts of prevention, training of technical personnel in the scientific and practical aspects of prophylaxis and treatment.

The first is carried out in Cuba by the usual means of propaganda, including an annual Christmas Seal campaign and the publication of a bulletin which is sent free to schools, welfare and other similar organizations.

As I have already stated, the social and medical importance of tuberculosis in Cuba prompted the creation at the Medical School

of the University of Havana, of a Chair of Tuberculosis, one of the first to be instituted anywhere.

Special instruction in tuberculosis was included in the curriculum in 1923. Soon after, the Chair of Tuberculosis began its activities in teaching the senior students the theoretical and practical aspects of diagnosis, treatment and prophylaxis.

These activities center around the "Instituto de Vías Respiratorias," a clinical unit for diagnosis and treatment of respiratory diseases. By arrangement between the University of Havana and the National Council of Tuberculosis, this Institute will be enlarged to become a center of research and investigation in the field of respiratory diseases under the direction of Dr. A. Antonetti, Professor of Tuberculosis, at present Vice-President of our Cuban Chapter.

Other educational aspects are represented by postgraduate courses for physicians and for nurses, given under the auspices of the Chair of Tuberculosis of the University of Havana, with the cooperation of the National Council of Tuberculosis.

Interest in tuberculosis is stimulated also by the activities of the "Sociedad de Tisiología," a scientific group holding regular meetings in which the different aspects of this disease are considered and discussed. The proceedings at these meetings are published in a bulletin along with other works received from national or foreign contributors.

Reciprocity with other countries is also fostered by delegations sent to international meetings and congresses on tuberculosis. At the Pan-American Tuberculosis Congress held in Argentina in 1940, the city of Havana was selected as the seat of the 1943 meeting of the ULAST (Latin-American Union of Pthisiological Societies) and a member of the Cuban delegation, our Fellow, Dr. J. J. Castillo, was elected to preside.

Our Cuban Chapter in the short time since its organization has already contributed to the movement against tuberculosis with its scientific sessions and by advocation through the National Committee for Medical Preparedness, presided over by our Fellow, Dr. P. Fariñas, the adoption of special measures to detect tuberculosis among draftees for military service. In this connection I want to acknowledge the assistance rendered by our parent organization in supplying valuable data. In the course of time our contribution is bound to increase.

In summarizing the present tuberculosis status in Cuba we may say that our population, as is the case in many other countries in the world, is in a condition of widespread tuberculization, and that an energetic anti-tuberculosis campaign is being promoted through the agency of the National Council of Tuberculosis. The next development in this campaign will comprise extensive surveys, in-

creased hospital facilities, BCG vaccination, and the setting up of a system of social insurance against tuberculosis that will tend to spread the financial burden of the campaign.

We realize that the tuberculosis problem in Cuba is one of the first magnitude, involving many and complex social, economic and sanitary factors.

Its eventual control calls for decades of sustained and unremitting effort.

Past achievement in meeting and solving other grave public health problems gives us encouragement.

We earnestly hope that after this conflict is fought and won, readjustment of social and economic conditions, on the basis of a more equal distribution of wealth among the peoples as among the individuals, will result in the improvement of the lot of a large part of the human race and help to win its age-long fight against the white plague.

PAN-AMERICAN NEWS

PUERTO RICO ORGANIZES CHAPTER

At a meeting held in Rio Piedras, Puerto Rico, January 31, 1943, a Chapter of the American College of Chest Physicians was organized. Dr. J. Rodriguez Pastor served as Chairman for the meeting and Dr. A. M. Marchand as Acting Secretary. A motion was made and approved that the Sociedad Puertorriquena de Tisiologos become an official chapter of the American College of Chest Physicians. A Constitution and By-Laws for the Chapter were approved in keeping with the aims and purposes of the American College of Chest Physicians, and the following officers were elected:

Officers

President, Dr. David Garcia, Hato Rey; Vice-President, Dr. J. A. Franco, Rio Piedras; Secretary-Treasurer, Dr. A. M. Marchand, Santurce.

Board of Directors

Dr. M. Godreau, Ponce; Dr. M. Santiago, Caguas; Dr. M. Guzman Rodriguez, Mayaguez; Dr. A. Acosta Velarde, Santurce.

The names of Dr. J. Rodriguez Pastor and Dr. Jacob Smith were approved for recommendation to the Board of Regents of the American College of Chest Physicians for appointment as Regent and Governor, respectively, for Puerto Rico.

Changes in the Constitution and By-Laws to comply with specific recommendations made by the Puerto Rico Chapter of the College were submitted to the Board of Regents of the American College of Chest Physicians, meeting in Chicago, February 14, 1943. These changes were approved by the Board of Regents of the College and the petition of the Puerto Rico Chapter for a charter was granted.

CUBAN CHAPTER MEETING

The Cuban Chapter of the American College of Chest Physicians held a meeting at the Institute "Vias Respiratorias" at Havana, Cuba, on January 21, 1943. The following program was presented: Report of the Sociedad Puertorriquena de Tisiologia, by Dr. Jose Rodriguez Pastor, Santurce, Puerto Rico; "Tuberculosis in the Personnel of the Sanatorium," by Dr. Donato G. Alarcon, Mexico City, D. F.; Presentation of Clinical Cases, by Drs. J. Montes Rensoli, R. Sanchez Acosta and Octavio Rivero, Havana, Cuba.

ARGENTINE MINISTER OF THE INTERIOR REQUESTS COLLEGE COOPERATION

The Council on Pan American Affairs of the College is cooperating with the Minister of the Interior of the Republic of Argentina to effect the exchange of information concerning aid, prevention, research, and legislation with regards to the tuberculous. An invitation to participate in this activity was extended to the American College of Chest Physicians in a communication from the National Commission for the Study of Tuberculosis.

BRAZIL ORGANIZES CHAPTER

In a communication from Dr. Affonso MacDowell, Rio de Janeiro, Regent of the American College of Chest Physicians for Brazil, notice was given to the effect that a Brazilian Chapter of the College was organized on November 13 and a Board of Directors elected. The names of the officers and directors of this chapter have not as yet reached the Executive Offices of the College.

GOVERNOR OF PERU REPORTS ON MEDICAL EDUCATION

Dr. Ovidio Garcia-Rosell, Lima, the Governor of the American College of Chest Physicians for Peru, reported that up until 1934, the teaching of chronic diseases of the lungs was included in the curriculum under Internal Medicine at the San Marcos National University (Universidad Nacional Mayor de San Marcos). This is the only medical school in Peru. In 1934, an auxiliary Chair for Clinical Tuberculosis was added, and some years later, a Chair for Phthisiologie independent of Internal Medicine, was founded and this course was added to the curriculum and made obligatory for students in the fourth year of Medicine.

Dr. Ovidio Garcia-Rosell was appointed Professor of Phthisiologie in the Faculty of Medicine of the San Marcos National University, and Dr. Juan A. Werner was appointed Associate Professor. Three assistants were appointed, one for clinical practice, one for surgical practice, and one for the dispensary. Facilities for the purpose of teaching consist of two hospital services, totalling 150 beds for tuberculosis patients.

Four hours are devoted for clinical practice and two hours are given over to theoretical lectures each week during a period of six months. The complete course for medicine is two years pre medical and seven years in the medical school.

MEXICO REPORTS ON COLLEGE MEETING

In the September-October, 1942, issue of *Revista Mexicana de Tuberculosis,* a complete report of the Eighth Annual Meeting of the American College of Chest Physicians, held at Atlantic City, June 6-8, 1942, was published. The following delegation from Mexico attended the College meeting at Atlantic City:

Dr. Donato G. Alarcon, Dr. Jesus Benitez, Dr. Abraham Ayala Gonzalez, Dr. Miguel Jimenez, Dr. Fernando Katz, Dr. Aradio Lozano, Dr. Jose Raynal, Dr. Fernando Rebora.

DOMINICAN REPUBLIC

Dr. Juan Manuel Moscoso, a member of the Cuban Chapter of the American College of Chest Physicians, has been recently appointed by the Dominican Republic, as Director of the new sanatorium for tuberculosis, "Dr. Martos," at Ciudad Trujillo, Dominican Republic. This institution has been named after Dr. Joaquin Martos, the late Director of "La Esperanza" at Havana, Cuba. Dr. Moscoso is at present in charge of the tuberculosis campaign in his country.

COLLEGE NEWS

The Texas Chapter of the American College of Chest Physicians will hold its annual meeting at the State Tuberculosis Sanatorium on May 9, 1943. For further particulars concerning this meeting write to Dr. R. G. McCorkle, 1214 Nix Building, San Antonio, Texas.

Plans have been perfected to increase the bed capacity of Hazelwood Sanatorium, Louisville, Kentucky, from 120 beds to 382, with a special ward for Negroes. Additions to the sanatorium are expected to cost $300,000. Dr. Paul A. Turner, Regent of the American College of Chest Physicians, is superintendent of the sanatorium.

Dr. James A. Downing, Des Moines, Iowa, was inducted as president of the Polk County Medical Society at its annual meeting.

Dr. J. Carl Painter, Dubuque, Iowa, Governor of the College, was elected as delegate to the State Medical Society at the annual meeting of the Dubuque County Medical Society.

Dr. Andrew L. Banyai, Wauwatosa, Wisconsin, Regent of the American College of Chest Physicians, spoke on "Non-Tuberculous Pulmonary Infections" at the meeting of the West Allis Medical Society, West Allis, Wisconsin, December 3, 1942.

Dr. Joseph B. Stockholm, Cleveland, Ohio, Fellow of the College and Medical Director of the Cuyahoga County Tuberculosis Dispensary, has been appointed controller of tuberculosis for Cuyahoga County. With this appointment, the case-finding program, nursing activities, clinics, admissions, hospitalization, record keeping and rehabilitation services in the entire county have been placed under one administrative officer.

The following Fellows of the American College of Chest Physicians contributed articles published in the January, 1943, issue of "The United States Naval Medical Bulletin." Lt. J. Emerson Dailey, "Foreign Body in the Esophagus"; Lt. Comdr. B. E. Goodrich, "A Clinical Study of an Outbreak of Scarlet Fever"; Lt. Comdr. D. W. Wheeler, "Shock: Its Nature and Therapy."

Mid-Winter Meeting Board of Regents

The Mid-Winter Meeting of the Board of Regents of the American College of Chest Physicians was held at the Palmer House, Chicago, Illinois, February 14, 1943, with Dr. J. Winthrop Peabody, Washington, D. C., President, presiding.

1943 Annual Meeting

Dr. Myers, Minnesota, read a report concerning the annual meeting of the College. The question of whether or not a meeting should be held was thrown open for discussion. The following resolution was then adopted:

WHEREAS: The American Medical Association has cancelled its annual meeting for the year nineteen hundred and forty-three; and WHEREAS: The American College of Chest Physicians has since its inception held its meetings jointly with the annual meetings of the American Medical Association,

BE IT RESOLVED: That the Board of Regents of the American College of Chest Physicians meeting in Executive Session in the City of Chicago on the fourteenth day of February in the year nineteen hundred and forty-three, hereby proposes that the 1943 annual session of the American College of Chest Physicians be cancelled and that the reasons for the cancelling of this meeting are the same as those advanced by the Executive Council of the American Medical Association.

It was recommended that the state and regional chapters of the College be encouraged to hold meetings and prepare interesting programs.

Dr. Banyai, Wisconsin, moved that a list be compiled of nationally known outstanding members of the College who are recognized authorities in the diagnosis and treatment of diseases of the chest and allied specialties, and in the field of research pertaining to problems concerned with diseases of the chest; and that this list of outstanding chest specialists be submitted to groups that contemplate holding meetings, and that a selection of the speakers be made optional and that the College offer all possible assistance for the organization and arrangement of such meetings. This was seconded by Dr. Mark, Ohio, and unanimously carried.

Dr. Holinger, Chicago, moved that a blanket invitation be extended to all members of the College to attend the chapter meetings. This was seconded by Dr. Turner, Kentucky, and unanimously passed.

Board of Certification

A proposal was introduced by Dr. Joseph C. Placak, Ohio, which read as follows:

WHEREAS, The Board of Regents of the American College of Chest Physicians desires to establish a Board of Certification for chest specialists, and

WHEREAS, there are many interlocking factors to be considered; Therefore, be it proposed that the President of the College be authorized to appoint a committee to make a complete study of this entire problem and report their findings at the next meeting of the Board of Regents of the American College of Chest Physicians.

Dr. Banyai, Wisconsin, moved the adoption of this resolution and it was seconded by Dr. Holinger, Chicago, and adopted.

The appointment of the members of this committee was taken under advisement by the President and the members of this committee will be announced at a later date.

Annual Dues for Men in the Armed Services

Dr. Holinger, Chicago, introduced the following resolution:

THAT all members of the College pay their annual dues. However, that dues of men in the armed forces, who have paid their full initiation fee, may be waived upon written request, addressed to the Chairman of the Board of Regents of the College.

Dr. Mark, Ohio, moved the adoption of this resolution. Dr. Turner, Kentucky, seconded and it was adopted.

Chapters in Foreign Countries

A proposal was introduced by Dr. Holinger, Chicago, to read as follows:

BE IT RESOLVED, That 50 per cent of the membership dues be retained by the chapter of the College for their operating expenses and 50 per cent of the annual dues be retained by the American College of Chest Physicians from members in those countries or territories outside the United States where chapters of the College have been authorized.

BE IT FURTHER RESOLVED, That in those countries where a chapter has been organized, the Fellowship Fee is to be $50.00, of which $25.00 is to be retained by the chapter and $25.00 is to be retained by the American College of Chest Physicians.

Acceptance of this proposal was moved by Dr. Turner, Kentucky, and seconded by Dr. Hayes, California, and unanimously adopted.

Examinations

A resolution was introduced by Dr. Placak, Ohio, as follows:

BE IT RESOLVED, That all candidates for Fellowship in the College be required to pass certain basic examinations dealing with the general subject of diseases of the chest and be it further resolved, that applicants applying for Fellowship in the College in specialties related to diseases of the chest pass, in addition to the general examination, an examination dealing with the specialty under which the application is submitted.

Dr. Spector, Missouri, discussed this resolution, stating that it was embarrassing for the Governors and Regents of the College not to have a definite statement with regards to eligibility of applicants.

Dr. Turner, Kentucky, stated that every applicant for Fellowship in the College should be informed that he has to pass an examination on chest diseases and that this would eliminate this problem.

Dr. Hudson, Michigan, stated that the requirement that they pass an examination on the basic and fundamental principles of chest diseases would eliminate those men who do not now know all that they should about diseases of the chest.

This proposal was revised to read as follows:

BE IT RESOLVED, That all candidates for Fellowship in the College be required to pass a basic examination dealing with the general subject of diseases of the chest, unless waived by the Board of Regents.

Dr. Overholt, Massachusetts, moved that the revised resolution be adopted. This was seconded by Dr. Turner, Kentucky, and passed.

Rationing of Food for Hospitals

Dr. Mark, Ohio, presented the following resolution submitted by the Pennsylvania Chapter of the College, and a letter received from Dr. Newcomb, governor of the College for New Jersey:

"BE IT RESOLVED, That inasmuch as adequate nutrition is a vital factor in the prevention, treatment and sustained health of tuberculous individuals; the Pennsylvania Chapter does hereby recommend to the Board of Regents of the American College of Chest Physicians that early appropriate action should be taken by them with the Federal Government in Washington, D. C., urging the following considerations:

"(1) That the proposed food rationing should take cognizance of the special nutritional requirements of those known to be tuberculous whether under treatment or not.

"(2) That food quotas to all sanatoria, hospitals, and other institutions harboring tuberculous patients, known tuberculous inmates or employees, be adequate for the special needs of such individuals.

"(3) That, of the above quotas, meat, fish, eggs, dairy products, and high vitamin containing fruits and vegetables are of the greatest importance."

On January 29, 1943, a letter was received from Dr. Newcomb, New Jersey, suggesting that the Board of Regents go on record as recommending to the WPB that sanatoria, hospitals, and nursing cottages, especially the ones treating tuberculosis, have a blanket priority that will cover all replacements and repairs.

Dr. Mark then presented the following resolution and moved its adoption:

BE IT RESOLVED, That the Board of Regents of the American College of Chest Physicians, meeting in regular session at the Palmer House,

Chicago, February 14, 1943, authorize the Resolutions Committee of the College to prepare and formulate a resolution requesting that preference and priorities be given to hospitals and sanatoria with regards to the rationing of food, replacements and repairs for hospitals and sanatoria and the freezing of essential employees necessary to efficiently operate these institutions.

This was seconded by Dr. Banyai, Wisconsin, and passed. (This resolution was referred to the Resolutions Committee.)

College Adopts F. C. C. P.

Dr. Stygall, Indiana, introduced the following resolution:

BE IT RESOLVED; That the letters F. C. C. P. be officially recognized and hereby authorized by the Board of Regents of the American College of Chest Physicians as the only symbol to be used to indicate Fellowship in the American College of Chest Physicians.

Dr. Stygall moved the adoption of this resolution and it was seconded by Dr. Banyai, Wisconsin, and unanimously passed.

Insignia for Key

Dr. Placak, Ohio, read the following resolution:

BE IT RESOLVED, That the Board of Regents approve the action of the committee and that the committee be granted the authority to proceed with the manufacture of these keys. The cost of the plate to be paid for by the College and same to be pro rated and added to the cost of the key which in turn is to be sold to such Fellows of the College who desire to purchase the keys.

Dr. Holinger, Chicago, moved the adoption of this resolution and it was seconded by Dr. Turner, Kentucky, and unanimously approved.

Plan for Life Membership

Dr. Overholt, Massachusetts, presented the following plan for life membership in the College:

In lieu of annual dues, a Fellow may become a life member of the College upon the payment of $300.00, plus the initiation fee, up to the age of 45 years. From 45 years of age to 58 years of age, a Fellow shall pay an amount equivalent to the total amount of dues he would ordinarily pay from his present age to the age of 65 years (upon reaching the age of 65, the By-Laws provide that a member's dues may be waived for the balance of his life; but, in effect, he becomes an inactive member, because he does not receive the journal, the directory, or other publications except upon direct subscription.) From the age of 58 forward, the minimum Life Membership Fee shall be $100.00. In addition, to the original initiation fee.

BE IT THEREFORE RESOLVED, That the above proposal be approved by the Board of Regents of the College to be effective as of this date.

Dr. Holinger, Chicago, moved the adoption of this resolution, with the following addition:

That all fees collected from life membership be put into an endowment fund.

Dr. Banyai, Wisconsin, seconded this proposal and it was adopted.

Surveys

Dr. Myers, Minnesota, spoke on surveys and recordings of scientific talks and these were referred to the Executive Council of the College for further study.

Historian

The following proposal was introduced by Dr. Spector, Missouri, and he moved its adoption:

BE IT RESOLVED, That the Board of Regents hereby authorize the President of the American College of Chest Physicians to appoint a member of the College to serve as Historian for a period of three years.

This was seconded by Dr. Mark, Ohio, and unanimously passed.

Present Officers to Serve

Dr. Banyai, Wisconsin, presented the following resolution:

Until such time as the annual meeting of the American College of Chest Physicians be held, that the present officers, regents and governors continue to serve in office until an annual meeting of the College is held.

Dr. Mark, Ohio, moved the adoption and it was seconded by Dr. Holinger, Chicago, and unanimously passed.

Dr. Overholt move that the Executive Secretary be instructed to write a letter of appreciation to the Surgeons General of the Army, Navy and U. S. Public Health Service, expressing appreciation for their cooperation in assigning General Marietta, Captain Duncan and Dr. Hilleboe, respectively, to the meeting of the Board of Regents of the College on February 14. This was seconded by Dr. Turner, Kentucky, and unanimously passed.

Dr. Holinger moved that a resolution be sent to the Executive Offices of the College complimenting them on the 1943 directory. He further moved that a resolution be sent to Dr. Matson and the members of the Editorial Board complimenting them on the new journal. (It was suggested by the President that Dr. Holinger be included in this resolution because of the fact that he collected the papers for the issue). This resolution was adopted without a dissenting vote.

The meeting adjourned at 5:00 P. M.

The following Regents, Governors and invited guests attended the Mid-Winter Meeting of the Board of Regents, held at Chicago on February 14:

Dr. Andrew L. Banyai, Wauwatosa, Wisconsin
Dr. E. W. Hayes, Monrovia, California
Dr. Paul Holinger, Chicago, Illinois
Dr. Louis Mark, Columbus, Ohio
Dr. Jay A. Myers, Minneapolis, Minnesota
Dr. Richard Overholt, Brookline, Massachusetts
Dr. J. Winthrop Peabody, Washington, D. C.
Dr. Joseph C. Placak, Cleveland, Ohio
Dr. H. I. Spector, St. Louis, Missouri
Dr. James H. Stygall, Indianapolis, Indiana
Dr. Paul A. Turner, Louisville, Kentucky

Governors

Dr. Wm. A. Hudson, Detroit, Michigan, Chairman
Dr. Benjamin L. Brock, Waverly Hills, Kentucky
Dr. John H. Allen, Omaha, Nebraska
Captain Robert E. Duncan, Washington, D. C.
Dr. Herman E. Hilleboe, Washington, D. C.
Brigadier General S. U. Marietta, Washington, D. C.
Dr. Wm. Ogden, Toronto, Canada
Dr. J. Carl Painter, Dubuque, Iowa

Chapter Officers

Dr. M. H. Draper, Fort Wayne, Indiana, President, Indiana Chapter
Dr. Alvis Greer, Houston, Texas, Vice-President, Texas Chapter
Dr. Paul Murphy, St. Louis, Missouri, President, Missouri Chapter

Members

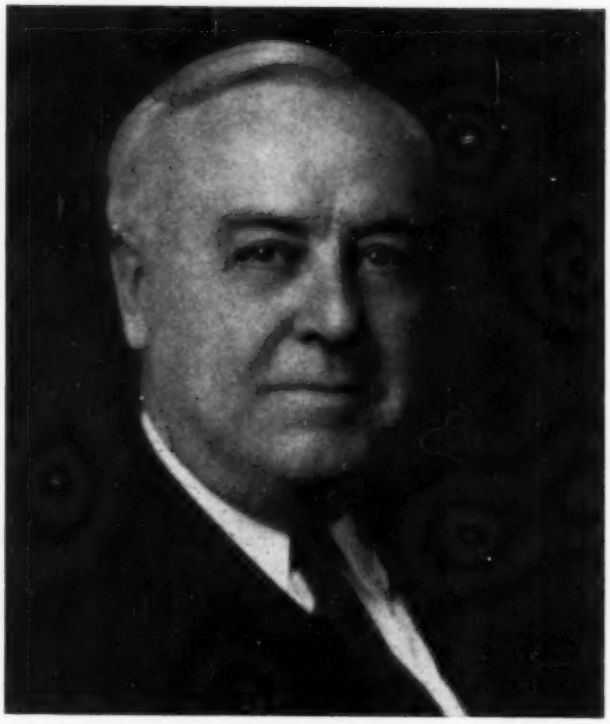
Dr. Alfred Busse, Jefferson, Wisconsin
Dr. Bert L. Jones, Dwight, Illinois
Dr. Richard Davison, Chicago, Illinois
Dr. Jerome R. Head, Chicago, Illinois
Dr. Julius B. Novak, Chicago, Illinois
Dr. Otto C. Schlack, Oak Forest, Illinois

A cocktail party was given preceding the dinner for the members of the Board of Regents, Governors, Chapter Officers and guests by Dr. Paul H. Holinger, Chicago.

Open House was held after the dinner by Dr. Otto C. Schlack and Dr. Minas Joannides, Chicago, in Suite 1650 and 1651W.

A Personal Appreciation

By J. ARTHUR MYERS



JOHN H. PECK

Clinician, Administrator, Educator

1879-1942

On August 3, 1879, in the village of Lost Nation, Iowa, a son was born to Anna and Henry Peck. They named the infant John Hyren. There must have been many thoughts in the minds of the mother and father with reference to the future of this boy, as they nurtured him through infancy and childhood: What would he choose for his life's work? What would he contribute to the world? While John was still an infant the family moved to Olin, Iowa, where in due time, he attended the public schools. Throughout his school years he was an industrious student and took an active part on the playground. His evenings, Saturdays, and many holidays were devoted to extra work. After graduating from the Olin high school he was employed as deputy of the District Court in Anamosa, Iowa.

Since childhood he had manifested a strong desire to be helpful to others; therefore, in 1905 he entered the Iowa University College of Medicine. Here, he was a superior and a popular student. He was a member of Sigma Alpha Epsilon and Nu Sigma Nu fraternities, was president of his class, and in the senior year was elected to the honorary medical scholarship fraternity, Alpha Omega Alpha. He graduated in 1909.

Following graduation, Dr. Peck spent one year as assistant in the School of Medicine. He then moved to Des Moines where he became Associate Professor of Medicine in Drake University. When the Medical Department of this institution was discontinued, he established a private practice in Des Moines. Because of special interest in diseases of the chest, and particularly tuberculosis, he went to the State Sanatorium at Oakdale in 1912, and spent several months as resident physician. While he contributed much to the welfare of the patients, he also studied diseases of the chest diligently before returning to practice in Des Moines. On account of his expertness in diseases of the chest, his services were sought by large numbers of persons. He saw the great need of a sanatorium where patients with contagious disease could be isolated and treated. Thus, he took an active part in the establishment of the Broadlawns Sanatorium in Des Moines and was medical director of this institution for several years in conjunction with his private practice.

It was obvious to Dr. Peck that a great deal of educational work must be done throughout the State of Iowa in order to secure the proper cooperation of the public in controlling tuberculosis. Therefore, he began to stimulate interest in the minds of his friends and associates, in establishing a state organization; in fact, he was a pioneer in the formation of the Iowa Tuberculosis Association, and was its president from 1918 to 1934. This attests the extreme confidence the tuberculosis workers of the State of Iowa had in him. He not only served as president, but also became its clinician. In this latter capacity he traveled hundreds of thousands of miles, holding clinics and giving demonstrations on the diagnosis, treatment and prevention of tuberculosis before medical, social, nursing and many other groups. Indeed, Dr. Peck was always willing to speak before any group—no matter how large or how small, or how far from home—in order to disseminate knowledge of tuberculosis. No matter whether he spoke before a learned society or a group of persons who had little or no formal education, he was able to present his subject in such a way that it was easily understood. His addresses were interesting, interspersed with humor and, at the same time, forceful.

He believed that each physician's office should be a diagnostic center for tuberculosis. Therefore, he put forth special effort to become acquainted with every physician in the state. He could call more physicians by name, whether he saw them in their home town or in some remote part of the country, than any person I ever met. Thus, the physicians throughout the State of Iowa came to know, to admire, and to respect him not only because of his vast store of information concerning tuberculosis and its practical application, but also because he was genial and strictly ethical in all his dealings with them. They recognized him as a leader not only in the field of tuberculosis, but also in various other phases of medicine. This confidence of physicians in him was manifested by his election to the Polk County Medical Society at Des Moines in 1919, and to the presidency of the Iowa State Medical Association in 1930.

Early in his career, Dr. Peck began to look beyond the State of Iowa and became interested in the national campaign to control tuberculosis. Here he promptly gained the respect and confidence of physicians and others in the national field. Indeed, he was so respected by the tuberculosis workers throughout the Nation that in 1932, they elected him to the presidency of the National Tuberculosis Association, which at that time was the greatest honor that could be bestowed upon any tuberculosis worker

in America. During the year that Dr. Peck was president he devoted an unusually large amount of time to the Association, making many personal sacrifices in order to promote tuberculosis control work throughout the United States. While serving as president, Dr. Peck was delegated to attend the International Union against Tuberculosis at The Hague, Holland. When the annual meeting of the National Association was held at Toronto, Canada, he conducted it in such an admirable manner as to be the pride of all the tuberculosis workers in attendance from the United States. Dr. Peck was a member of the Board of Directors of the National Tuberculosis Association for many years. He also served on numerous committees, including the Executive Committee. No person, aside from the full-time paid workers, has yet lived who has contributed more time and effort to the welfare of the National Tuberculosis Association than Dr. Peck; moreover, this organization has never had a better friend.

The American College of Chest Physicians, which is composed of approximately twelve hundred chest specialists and which holds its annual sessions at the time of the meetings of the American Medical Association, had such confidence in Dr. Peck as to elect him president in 1940. He served in this capacity in a manner which stimulated great interest in the organization, not only in the United States, but also in the nations of Central and South America.

The Mississippi Valley Conference on Tuberculosis which is composed of workers from thirteen states in the upper Mississippi Valley, also elected him to its presidency.

Dr. Peck was a member and took an active part in numerous other organizations, such as the American Medical Association and the American College of Physicians.

In November 1936, he moved from Des Moines to Oakdale, Iowa, where he became superintendent of the Iowa State Sanatorium. His long years of experience, his vast knowledge of tuberculosis, his wide acquaintance with patients, physicians and all other tuberculosis workers of the state, his understanding of and his sympathy for the patients, and his great desire to search for cases of tuberculosis made him an ideal superintendent. His secretary, Mrs. Sadie Seagrave, said, "To me, the most amazing thing about Dr. Peck was the ease with which he mastered or acquired an understanding of so many different things. He could fathom the intricacies of a blueprint or any kind of a drawing; cross sections had no terror for him. He would have made a splendid architect. He could understand the engineer's jargon and he was becoming a good farmer. It seems to me he could see farther and see more than any one I ever knew."

Dr. Peck had an unusual ability to inspire and encourage patients which in no small way, contributed to his fine treatment results. On numerous occasions I have been with him while he was examining and treating patients, both in his office in Des Moines and at the Iowa State Sanatorium. He was an accurate diagnostician and used the most modern methods of treatment. His advice and recommendations were always in the best interest of the patient. On one of his trips to Minneapolis and while he was president of the National Tuberculosis Association, he kindly consented to call on some of my patients. None of them had ever seen a president of the National Tuberculosis Association and they were somewhat nervous about having him call because they expected to see a stern, impersonal individual, far too busy to have any interest in them or their

problems. However, their impression of a president changed immediately when he entered their rooms, smiled, grasped their hands, and looked squarely into their eyes and offered words of encouragement. He told each one an appropriate story or manifested so much spontaneous humor as to bring laughter and smiles to even those who were most ill. Their financial status or position in life made no difference to him; he treated them all alike. When he left their rooms they had a new hope. He had helped them, not with drugs, but with that indefinable something which few physicians ever possess to the same degree as did Dr. Peck. There are literally thousands of persons living today who have had the benefit of his treatment. There are other thousands living who have been treated successfully by physicians whom Dr. Peck taught, either as medical students or as graduates.

One of the activities at the State Sanatorium in which he took great pride was that of teaching medical students from the University of Iowa, where he held the position as Lecturer on Tuberculosis. Students spent two weeks with him and his staff during which time they were taught the fundamentals of diagnosis, treatment, and prevention of tuberculosis. Indeed, he taught several hundred such students, many of whom have already graduated and are practicing much of what he taught them.

When I entered the field of chest diseases, Dr. Peck was already well established and was widely known. He took an unusual personal interest in my activities. Whenever he found me in error because of lack of information, experience and judgment, he corrected me in such a manner as to spare me embarrassment. We soon became close friends and for many years I have considered him as one of the best friends I have ever had. We have been together in nearly all the large cities of the United States, from coast to coast, and from the Gulf into Canada. In the State of Iowa, alone, we traveled thousands of miles together. On numerous occasions he met me at railroad stations and airports, when no hour in the night was too late or too early for him. From these points we drove in his automobile to the various places where tuberculosis meetings were to be held. After the meetings, on several occasions, he drove out of his way fifty to a hundred miles to transportation connections in order that I might be back at my regular work the next day. Whenever an invitation was extended to speak before an Iowa audience, I always wrote Dr. Peck to make sure it met with his approval. His replies were cordial and he nearly always stated that he would also attend the meeting. Later, I would learn from other sources that it was Dr. Peck, himself, who had originally suggested to the various groups that the invitation be extended. Thus, I came to know Dr. Peck as few men outside the State of Iowa knew him.

He was one of the most modest men I have known. He never talked about himself or boasted of his accomplishments. Indeed, I did not know of several significant honors that had been bestowed on him nor did I know that he had published as many as one and one-half dozen papers until the data were assembled for this sketch. These fine qualities, together with his vast store of information and his unusual ability to organize, caused him to be elected to the highest offices in the field of chest diseases in this Nation. He was as free from selfishness and jealousy as is possible for any man to be. He saw the good in every one and rarely spoke of the bad. At the same time he was firm and had the courage of his convictions.

When Dr. and Mrs. Robert Koch of Berlin, Germany, visited Dr. Koch's

brother in Iowa in 1908, Dr. Peck and his friends arranged for a picture of the Koch family. This has often been spoken of as the most unique picture ever made of Dr. Koch.

Dr. Peck early became convinced that tuberculosis among the cattle of Iowa was not only a serious economic problem but also that the disease is contagious to man and that it caused a great deal of illness, and even death, in human beings. Therefore, he lent his full force to the veterinarians of that state in their attempt to eradicate the disease from the cattle herds. I have accompanied him to meetings of legislators, particularly when the veterinarians' program of tuberculosis control was being so bitterly fought in Iowa even to the point of having been referred to as "The Cattle Testing War." Dr. Peck knew governors, legislators, and other high officials of the state so well that he usually addressed them by their first names. He had their respect and thus wielded a powerful influence in the making of laws that finally led to the control of the disease in cattle to such a degree that in 1936, the entire State of Iowa was designated as a modified accredited area. He considered this one of the finest accomplishments in the history of tuberculosis control in Iowa. He also became interested in the control of tuberculosis in fowls and swine and supported the veterinarians at every opportunity in their attempt to solve this serious problem.

Early in 1942, Dr. Peck extended an invitation to meet with the Lind County Medical Society at the State Sanatorium on March 12. Shortly before midnight on March 11, my train arrived in Cedar Rapids. He was standing on the station platform with the same smile and extended the same friendly greetings as on so many similar previous occasions. We then drove to Oakdale, a distance of about twenty-two miles. Upon reaching his home after midnight, we found a note from Mrs. Peck to the effect that we were to look on the dining room table. Lifting a cover from the table, Dr. Peck found a large platter of delicious sandwiches and other food. He eulogized Mrs. Peck as he had done so many times in the past; he stated that all through their married life she had done everything possible to make their home a happy one and that she had done so much to facilitate his work. I had long known that his countenance would brighten when anyone inquired about his sons, Paul and Dick. He had left no stone unturned in providing them with every possible advantage and now he took great pride in knowing that they are good American citizens and are doing well in their work. He was especially proud that they were both serving their country; John Richard (Dick) in the Army, and Paul David a pharmacist's mate in the Coast Guard. Dr. Peck, himself, served as major in the first World War, where he was chief of the tuberculosis service at the base hospital at Camp Dodge and Fort Des Moines.

Dr. Peck lamented the fact that his work had been such that he was not able to devote as much time to his family as he would have liked. No doubt his family made sacrifices in having him away so much, but they are more than compensated in knowing that he was constantly striving to help others and that on account of his work, thousands of families are happy today because their members have been spared illness and untimely death.

The next morning we went to the breakfast table where we were greeted by Mrs. Peck and Dr. Peck's ninety-year-old father. Everyone was made to feel as one of the family on visiting this typical American home. Dr.

and Mrs. Peck manifested true character in their gentleness and kindness to the father. Despite his age, he was sturdy and mentally alert. His eyes twinkled and an expression of satisfaction came over his face several times during the course of the meal when Dr. Peck told stories about him and joked with him.

After breakfast, we went to the administration building of the Sanatorium; Dr. Peck had arranged for an especially quiet room where I might write for a few hours. At noon, we drove to the Rotary Club luncheon in Iowa City where he had arranged for an address. A group of fine men in various walks of life had assembled and their admiration and respect for John Peck was clearly manifested throughout the meeting. At four o'clock some of the members of the Medical Society and invited guests assembled at Dr. Peck's home for an informal discussion of tuberculosis problems. At six o'clock, the large dining room in the Sanatorium was filled to capacity and immediately following the dinner the evening was devoted to the presentation and discussion of papers.

Dr. Peck pointed out that in some sanatoriums in this country as many as ten to thirty percent of the patients admitted do not have tuberculosis. Their physicians had not examined them with sufficient care or were willing to accept short-cut methods in diagnosis. He emphasized the fact that no single procedure, such as x-ray inspection of the chest, is adequate. Even after every phase of an adequate examination is completed, the physician often does not have any too much information to make the correct diagnosis. He lamented the fact that so many beds are occupied, even briefly, by such persons who do not have tuberculosis in those institutions where there are long waiting lists. He made a strong plea that all physicians adequately examine their patients and make sure that tuberculosis exists before sending them to a sanatorium.

Dr. Peck never adopted half-way procedures and he regretted that in so many places large surveys are being conducted in which diagnoses are made only on the basis of one or two phases of a complete examination. He knew the great harm this would bring to the many individuals examined and ultimately to the medical profession. Fads in treatment also irritated him because they so often give the patients a false sense of security until the disease has passed the stage when it can no longer be treated successfully by standard methods. He often spoke of at least two Iowa physicians who previously had almost solicited persons suffering from tuberculosis offering them a "sure cure" by methods which no other physician in all the world had found to be of any avail. He had gone directly to these physicians and had presented to them the facts. To his amazement, he said one of them told him that if he would support and recommend a certain form of treatment they would enter into a joint enterprise in which he might expect to become wealthy in a few years. Dr. Peck was not interested in wealth received at the expense of suffering humanity. He had already devoted a long lifetime to helping humanity and on several occasions he had put forth great effort to protect the tuberculous individual against those who seek personal gain for which they give nothing of value.

After the evening meeting on March 12, several physicians who were driving to Cedar Rapids invited me to ride with them. However, Dr. Peck insisted that he personally take me to the station in that city. As we drove through the Sanatorium grounds, he called my attention to a number of prisoners from the state reformatory who had been assigned

to him for work. He was deeply interested in them and had made a personal study of each one. He was particularly concerned about one boy who had been sent to the reformatory for a period of twenty years; he was not of the criminal type but had fallen into bad company and with a group of boys had committed an act, which otherwise he would not have done. From his study of these prisoners, Dr. Peck was convinced that many of them should never have been sent to the reformatory or detained there. He believed that some of them had peculiar mental quirks or even pathological conditions and that they should be treated in institutions for the mentally ill.

On the way to Cedar Rapids, we discussed many subjects. He praised the various members of his medical staff. Their fine work and extreme loyalty to the institution gave him a great sense of satisfaction. Dr. Peck's philosophy of life and his past experiences were such that any man would greatly profit to be in contact with him. We arrived at the railroad station just after midnight on the morning of March 13. As we clasped hands to part, his pleasant smile, expressed good wishes and his entire facial expression were manifestations of true friendship such as a man experiences only occasionally in a whole lifetime. We had talked about our next meeting. Neither of us suspected that we would not see the other again. As had been true of all our previous meetings, I had been made better through this last contact with Dr. Peck.

During the summer of 1942, Dr. Peck complained considerably of feeling weak; however, he remained at his work. He left his office at 5:30 on the evening of October 17. On the morning of the 18th, he ate a good breakfast but decided to stay in bed all day because he felt weaker than usual. At 6 o'clock that evening, he was up for a small amount of food. Soon after he retired to his bed, he had a severe pain and died of coronary thrombosis at 9:45. Funeral services were held on October 22, when friends from far and near filled the house and even the porches. Brief memorial addresses were presented by Dr. Glomset of Des Moines and Dr. Meyers of Boone, Iowa. In the afternoon at 4 o'clock, a second service was held at Olin, his home town, and a large crowd of long-time friends gathered to pay their greatest respects to the man of whom they had all been so proud. He was buried in a cemetery near Olin only a short distance from where he had been reared.

Dr. William M. Spear, who has so effectively aided in the development of the Iowa State Sanatorium and who thoroughly merited the recent appointment to the superintendency of the institution, said, "Spurred on by a great ambition which laid hold on him early in his professional career Dr. Peck continued at a hard and steady pace even after the time when most men welcome the loosened rein and the slackened trace. When one thinks of the amount of work he did, the things he accomplished, the incessant, furious pace he set, one wonders that he continued so long and so earnestly. The answer is perhaps found in the singleness of his purpose—the crusade against tuberculosis."

Thus, the infant of a few pounds in 1879 grew to great stature, being six feet and four inches tall, and weighing three hundred pounds, and developed correspondingly great mental capacities. He went out into the world to help suffering humanity; he created a state in which people could live more efficiently, happily, and longer than ever before. It is only his body that is dead. What he stood for, what he accomplished, and what he conveyed to so many persons can never die as long as civilization stands and women and men continue to fight disease.